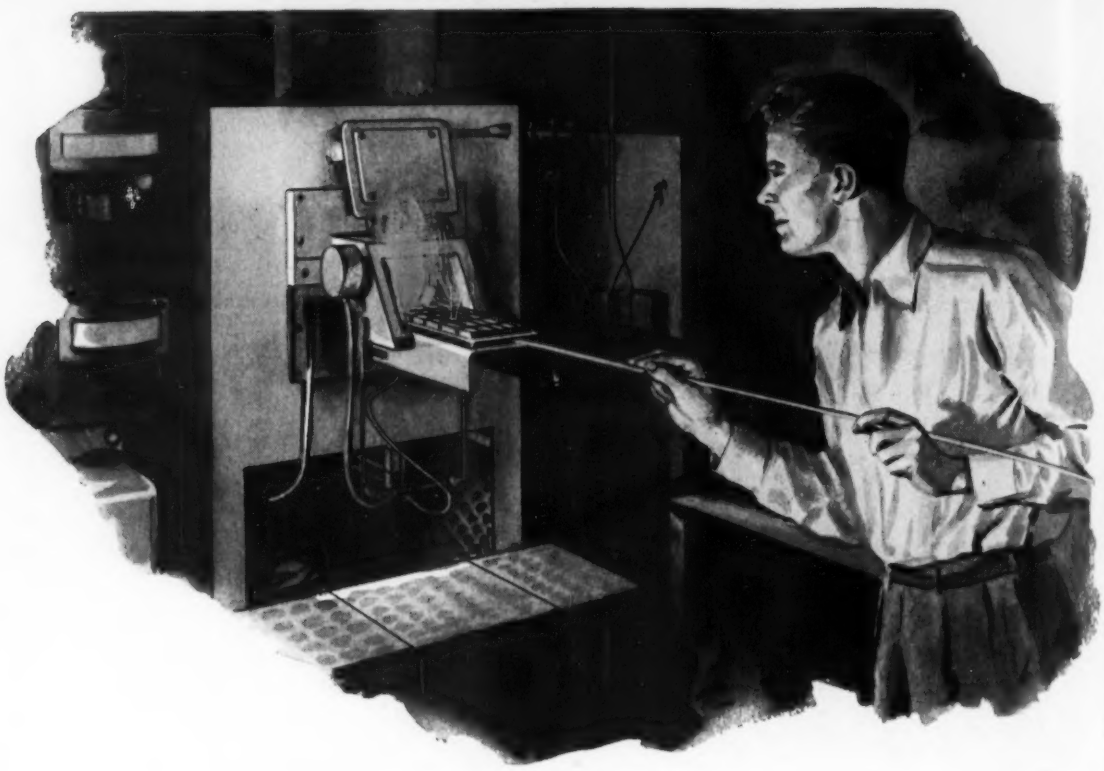
THE IRON AGE

THE NATIONAL METALWORKING WEEKLY July 20, 1950



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There's nothing revolutionary about Hoskins Furnaces, but you'll find them hard to beat when it comes to delivering useful electric heat. And for good reason, too. Because every Hoskins Electric Furnace is equipped with durable CHROMEL heating elements. Long-lasting elements that possess close-to-constant "hot" resistance between 700° and 2000°F., that deliver full-rated power throughout their long and useful life. Dependable heating elements designed to give you uniform distribution of heat with maximum operating efficiency. Important, too, every CHROMEL element in every Hoskins furnace is formed in such a way as to permit quick and easy replacement.

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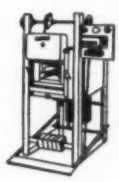
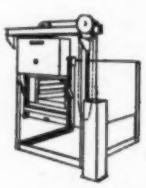
So next time you're in need of good dependable heating equipment, get the facts on Hoskins CHROMEL-equipped electric furnaces. Our Catalog-59R describes the line . . . want a copy?



TYPE FR-206, 207, 208 BOX FURNACE



TYPE FR-251 BOX FURNACE

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Whenever a bolting job comes along where the use of a standard fastener is uneconomical or impracticable, or both, use a "Special"—a fastener designed especially for the job.

Bethlehem's Lebanon, Pa., Plant specializes in the manufacture of "Specials." With their years of experience in producing fasteners tailored to unusual requirements, Lebanon Plant engineers can often improve on existing designs or come up with something entirely new—with resultant savings and other benefit to the user.

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THE IRON AGE

CONTENTS

JULY 20, 1950 • • • VOL. 166, No. 3

Special Article

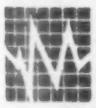
A single sample method for analysis of manganese bronze saves time, reagents, and apparatus. Percentages of tin, lead, copper, iron, manganese, nickel, aluminum, and zinc in samples can be accurately determined. Article outlines step-by-step procedure to be followed.—p. 87.

Issue Highlights

Controlling metal pouring to conform to the solidification rate improves centrifugal casting output. Controlled pouring can also improve ingot and sand casting production. For proper application of this theory, a knowledge of the basic hydraulic principles involved is essential.—p. 90.

Argentine's steel producer, ACINDAR, has increased its yearly tonnage from 3500 metric tons 7 years ago to a proposed 100,000 tons in 1950. Local labor was trained while steelmaking facilities were planned, built and expanded. American firms supplied technical advice and personnel.—p. 101.

When the military orders start to roll business-as-usual will be out. It is doubtful that voluntary allocations can stand the gaff. A controlled materials plan may be needed. There is no way to give military priority and still make all the things the people want.—p. 107.



Some purchasing agents who had been highly skeptical of forward buying for inventory have done a turnabout in their buying policy. This has caused an upsurge in demand for many commodities—from raw materials to finished goods. They blame uncertainties over military needs pending Washington decisions.—p. 109.

Structural fabricators who had been in the doldrums have come out with a bang. Some are now operating up to 100 pct of capacity. Prices have gone up in the past 4 months, but backlogs are good. Steel supply is now their biggest problem.—p. 111.

Coming Next Week

When solution heat treating aluminum, Northrop Aircraft quenches first in "fog" then in water. Warpage is cut to a point where little or no straightening is required. Physical properties are equal to those developed by plain water quenching.

Indexed in the Industrial Arts Index and the Engineering Index. Published every Thursday by the *CHILTON CO. (INC.)*, Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign Countries $25 per year. Single Copies 35¢. Annual Review Number, $2.00.

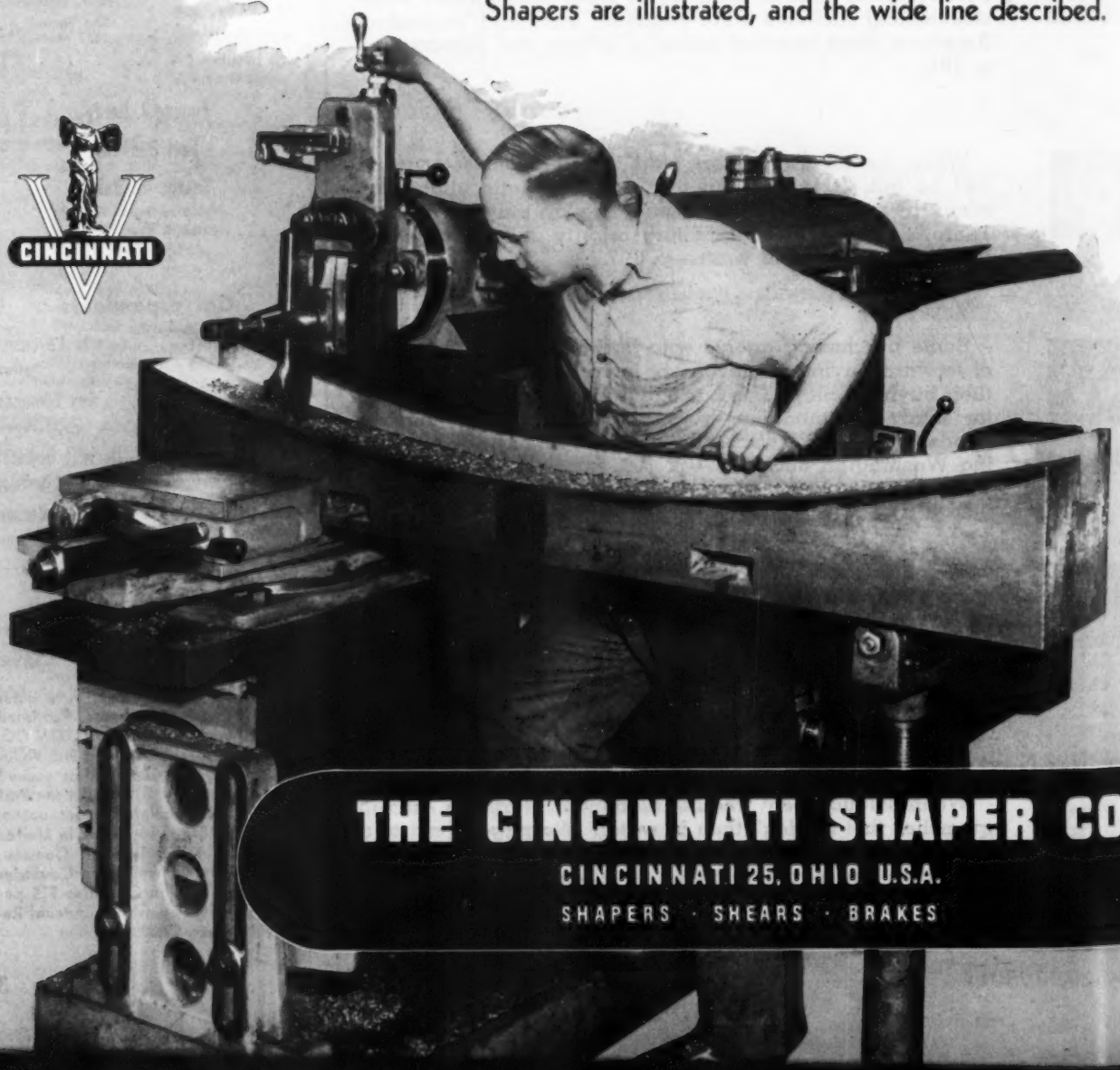
contour the special job on a Cincinnati Shaper...at low cost

The special job is often a time-eater — and a cost raiser.

This handy Cincinnati Shaper saves time — saves money — on many special jobs. Little time is lost on setups — costly fixtures and special equipment are not needed.

Contouring this 1200-pound tank stave die — roughed and finished in 4 hours — is done at low cost with simple tools and simple setup. It is an example of many jobs performed on versatile Cincinnati Shapers at lowered costs.

Write for Shaper Catalog N-5, where many uses of Cincinnati Shapers are illustrated, and the wide line described.



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Editorial

INDUSTRY VIEWPOINTS

Leave Us Have No Pussyfooting

THE American people can stand anything—if they are given the facts. During the past few weeks it looks as if the politicians and some government people forgot all they ever knew.

Only a few years ago we had a lot of pussyfooting—before the last war. Everything was going too rosy. We could have butter galore and still make guns. Well the time came when we saw that we could do nothing of the sort.

We are being told that we can have business as usual—and of course politics as usual. Businessmen and reporters are talked to as if they were children.

So far all we have had from Washington is pap. Maybe we will soon get down to business. But the important thing is that the American people—industry and the public—should have more from their government than kindergarten speech.

Let the government tell the real facts. Let them tell the people and industry that our enemies care nothing about human lives: That they believe in nothing we believe in. Let them tell the people that we can't even begin to know what the Communists will do because they don't think like us and never will.

Let us not kid the people either that they can have their cake and eat it too. It can't be done. It never has been done and it never will be done.

American industry is grown up. So is the public. They should be treated that way and not be given a lot of mysterious half truths or no truths.

If there are not enough realists in government to get things done quickly let's get someone who can and will do it. Tell business and the people what is expected of them and they will do it. If Washington is not strong, imaginative, decisive and forward looking you can't expect business and the public to be that way.

We do not fight a war with fairy tales and nicey nice talk. It is an insult to the people to try to give them this kind of taffy. Let's put an end to pussyfooting everywhere.

Tom C. Campbell

Editor

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NEED CHAINS? We can ship immediately from our large stock here at home or you can contact any one of our authorized Stock-carrying Distributors, strategically located throughout the United States to better serve your needs.

Our recently-enlarged Chain-making establishment (see photo below) is fully equipped with new high-speed tools . . every modern facility to make chains scientifically better . . faster.

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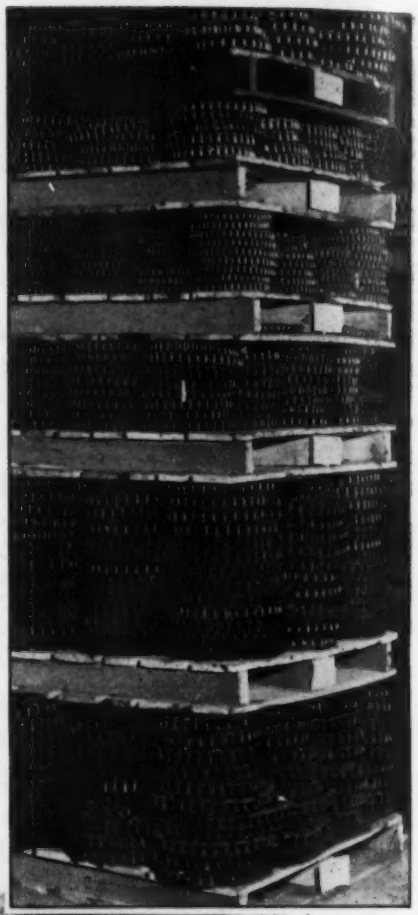
We will be glad to take care of your requirements . . will handle those "Ship At Once" requests promptly. May we hear from you?



Here you see the buildings in which Jeffrey Chains are manufactured . . a plant within a plant. As modern as progress will permit, our Chain-making departments are manned by skilled technicians who know Chains . . build for you.

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NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► As soon as military needs are known in the very near future their impact will be felt by industry. Some orders will be placed, either officially or unofficially, well in advance of expanded military appropriations by Congress. In many cases telephone feelers will precede actual orders.

► Aside from regular steel conversion some steel mills are converting semi-finished forms of other metals. Prominent in this nonferrous conversion is titanium. Work is being done at the stainless steel mills as the facilities and techniques are similar.

► Significantly, of all the Russian satellites, North Korea is the most wealthy in raw materials for iron and steel production. And the materials are concentrated in a reasonably small area.

► An airplane with a magnesium alloy skin seven times as thick as the normal thin aluminum alloy skin is under study. The thick-skinned plane would need fewer fittings and fastenings, and dispense with internal formers and supports, which take up precious fuel space in wings. Range of the F-80 Shooting Star has been increased up to 30 pct by these means.

► Manganese for American steel is coming more and more from South Africa, Gold Coast and India. Their combined exports of manganese ore to the U. S. is expected to be well over a million tons this year.

► A new metallic ceramic made from alumina and chromium is being tested for parts in ram jet engines, turbocharger blades and gas turbine nozzles. It is claimed to remain solid at extremely high temperatures and not crack under rapid temperature changes.

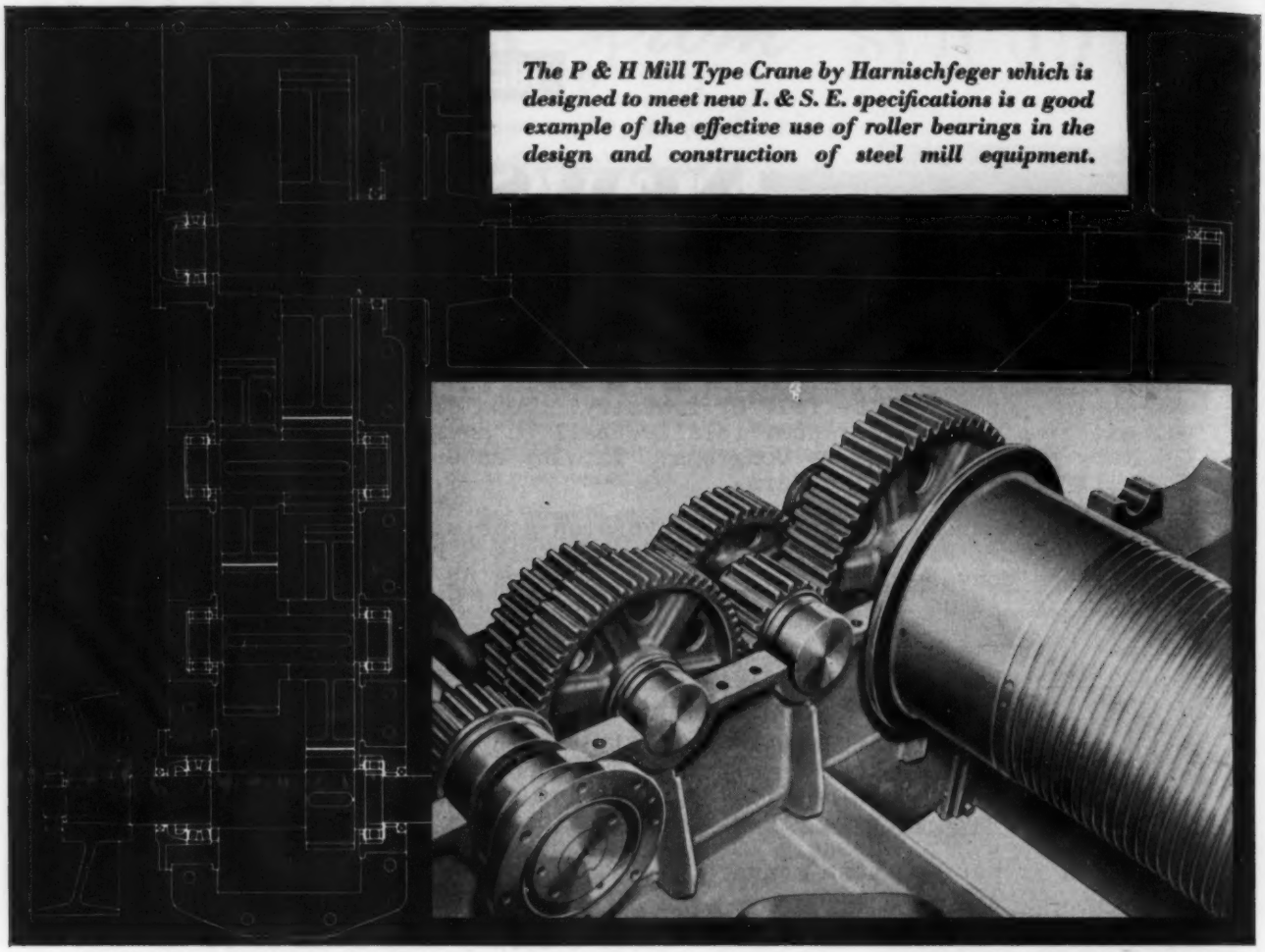
► Despite recent decreases in the price of steel scrap, there is still plenty of underlying strength in the market. A lot of scrap will be needed for a long time. Even the mills that stand to profit by cheaper scrap don't want prices to skid too much, lest another upturn become inevitable as brokers scramble to cover their orders.

► Television set production is estimated at about ½ million sets per month during the last half of the year. About half of them will use stainless steel cones requiring about 1000 tons of stainless per month.

► In modern machine tool practice the bottleneck is sometimes ability to load pieces in the machine as contrasted with previous inability to remove metal at a satisfactory rate. Recent experiments have demonstrated it is possible to remove metal at rates double and sometimes triple the former top limit.

► The Administration's attitude of business-as-usual is not being followed by industry. They are still taking orders as usual. But some of them have drastically altered their buying practices, and, in some lines, there is a trend toward escalator clauses in purchase agreements.

► Argentine's steel producer, ACINDAR, has increased its yearly tonnage from 3500 metric tons 7 years ago to an estimated 100,000 tons in 1950. Future expansion plans include a 600,000 metric ton blast furnace, four 150-ton openhearths and new blooming and billet mills.



The P & H Mill Type Crane by Harnischfeger which is designed to meet new I. & S. E. specifications is a good example of the effective use of roller bearings in the design and construction of steel mill equipment.

More capacity···longer crane life

The Hyatt Hy-Load Bearings in the gear case illustrated are straight radial bearings offering maximum load-carrying capacity in the space available. No radial capacity is sacrificed to provide for thrust loads and the shafts carrying the spur gears can position themselves laterally with location being taken against the smooth ends of the shafts.

The bearings are mounted in cartridges to facilitate handling and simplify machining by permitting through boring. The two-part non-adjustable Hyatt bearings are easily and quickly installed and their extra load-carrying capacity results in longer, trouble-free life.

On the drum shaft a Hyatt straight radial bearing is used at one end and a spherical bearing at the other. This provides ample provision for thrust loads, which occur when hoist cables unwind at an angle, and permits shaft expansion through the radial bearing with all danger of floating a bearing in the housing bore eliminated.

• • •

Your nearest Hyatt field office will provide the kind of bearing information that encourages effective design and construction. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J., Chicago, Pittsburgh, Detroit, and Oakland, Calif.

HYATT ROLLER BEARINGS

Defense Needs Still Unknown

Industry Sure to Cooperate

Consumers Playing All Angles

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

EVERYONE and his uncle are hammering on steel company doors this week trying to get steel. The seriousness of the Korean war has been brought home sharply, and fear that allocations will shortly push back civilian orders is causing one of the most frenzied steel markets since the early days of 1941.

In an attempt to squeeze more tonnage from the mills, steel consumers are pulling out of the bag every trick they have learned and their postwar procurement battles taught them plenty. Some are approaching steel sales executives with government orders and asking for extra tonnage over their normal allotment.

So far they have not been successful. Since almost all products are on allotment any plus tonnages would have to be taken out of other customers' allotments. Who to cut, and how much, poses an impossible problem for the mills. Most government orders they have been shown to date are normal, everyday orders, not related to any crisis. Hence, the mills have been telling these consumers that the tonnage needed to fill them will have to come out of their own allotments.

Quick Action Needed

Other consumers who have civilian business placed with one mill are trying to place military orders with other mills so as to have two steel sources—one for defense and for domestic business. Still other customers are pointing out their steel needs and trying to indicate their length of time on order books.

Not all of these practices are widespread. But they do demonstrate a trend which will grow until Washington stops "thinking" about voluntary allocations and does something about them. Such action is slated to take place this week or early next week. A full voluntary allocation Advisory Committee is expected to be named. The same people who were on the Dept. of Commerce's Advisory Committee right after the war will be back in Washington. They might meet this week or early next week and begin to function shortly thereafter.

Industry Will Cooperate

Meanwhile some steel companies are accepting war orders on the basis of their percentage of the industry's total ingot capacity. Full cooperation between industry and Government officials will help get things rolling. But this makeshift operation will be replaced as soon as the official government plan starts to work. By the end of this week manufacturers will find out how a small amount of defense business can greatly alter domestic production plans.

Some plants that are shutting down for summer vacations are alleviating their steel shortage slightly by receiving shipments through the shutdown period. Receipts of foreign steel are increasing, but they are having no effect on domestic sales. Warehouse stocks are low and unbalanced; growing business continues to drain them off almost as fast as they are received.

Pressure is increasing for nearly all types of steel products, and a large tonnage carryover into the fourth quarter is now expected. Although the fourth quarter could be sold out quickly, producers don't want to open their books until they learn definitely from Washington how steel is going to be distributed. A good deal of business has already been turned away pending clarification from the capitol.

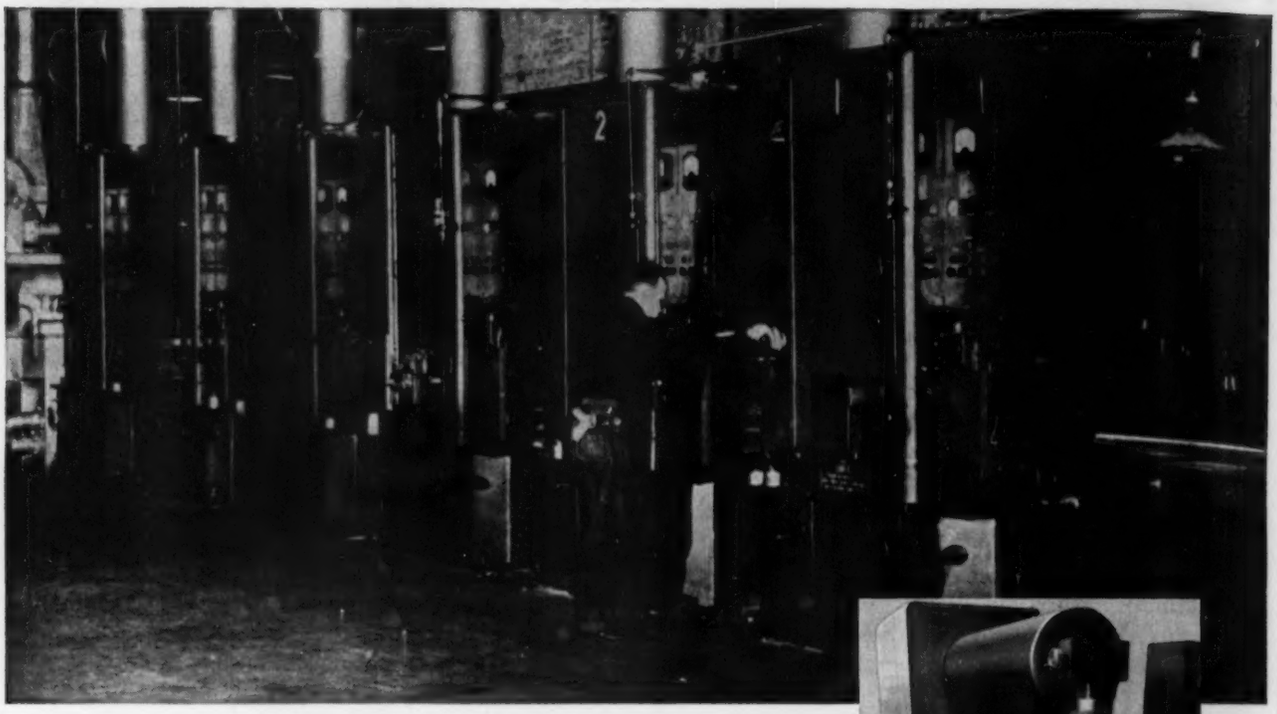
Scrap Prices Steady, Market Strong

Steel production men met one of their greatest challenges this week by scheduling steelmaking operations at 100 pct of rated capacity despite the handicap of vacations. This is an increase of 3½ points from last week and 7 points from the holiday week of July Fourth.

There were few price changes in steelmaking scrap, although markets in most areas are firmer than they have been for the past month. It is doubtful if there will be any wide price fluctuation until Washington clarifies our military and industrial needs.

(Nonferrous summary, p. 138)

Automotive Grilles by the "Thousands"



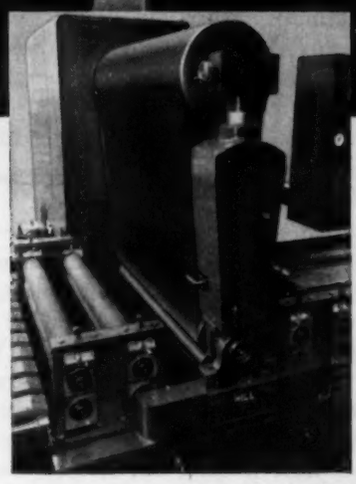
Six 36" "Hill" Abrasive Belt Pinch Roll Type Grinding and Polishing Machines.

"Hill" Abrasive Belt Polishers have again helped the Automotive Industry solve their problem of increased production and better quality at lower costs.

We can help you convert to the modern and efficient method of finishing by means of FLAT polishing.

"Hill" Abrasive Belt Polishers remove surface defects, develop high quality finishes and eliminate hand and contour operations on formed pieces. Sheets, plates, bars, coils and blanked shapes are ground and polished with astonishing results in costs and production figures.

The "Hill" 2-Roll Vertical Head is incorporated in three different models.



Hill 2-Roll Vertical Grinding Machine with cover removed, showing 126" endless abrasive belt, pneumatic belt centering device, power driven rubber covered feed rolls, etc.

A 100% Hydraulic Reciprocating Table Type for individual pieces.

B Power driven Pinch or Feed Roll Type for straight line operation.

C Strip Type for processing full length coiled material with reels.

Machines built in sizes up to 72" wide for polishing ferrous and non-ferrous metals

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Dear Editor

Letters from Readers

More on Powdered Metals

Sir:

In the waiting room of a large machine shop, we recently read your April 20 issue of THE IRON AGE. That issue contained several excellent articles on powder metallurgy.

We have exhausted local sources in attempting to obtain that issue, and have found that present subscribers refuse to relinquish their copies. We would appreciate it if we might obtain a copy of the metal powder articles.

P. B. EYRE
B. A. Hansen Co.
Buffalo

Your interest in this material is certainly appreciated, and copies of these articles have been forwarded.—Ed.

Sir:

Will you be so kind as to send us a copy of your illustrated 28-p. reprint, "The Metal Industry Takes to Powder."

M. A. RAUHOFF
Ironite Co.
Chicago

The reprint, "The Metal Industry Takes to Powder," comprises the full technical section of the April 20 issue. A few copies of this popular booklet are still available, and may be obtained free of charge by addressing Readers Service, THE IRON AGE, 100 E. 42nd St., New York 17.—Ed.

MDNA Coverage

Sir:

The coverage of our 1950 Detroit Convention in your Clearing House column was unquestionably the best we received. We appreciate your interest and attention to detail.

J. M. P. FOX
Executive Director
Machinery Dealers National Assn.
Chicago

Timely Report

Sir:

In your June 22 issue you carried an item, "What Time Is It?," on F. H. McGraw & Co.'s compendious time card showing what cities and states are on daylight or standard time. I want to report that as a result of this mention we received 43 letters from time-confused IRON AGE readers, and to date have mailed out over 250 cards at their request in an effort to unravel this bewildering summer time problem.

I am sure your readers are as grateful to you as we are at F. H. McGraw & Co., for your mention of the handy time card.

R. KANE
Public Relations Director
F. H. McGraw & Co.
Hartford

Popular Drawing

Sir:

In your Sept. 22, 1949 issue, there appeared an article on continuous casting by Smart and Smith. In the revision of my text "Manufacturing Processes," to be published soon, I am contemplating including a brief description of this process. Mr. Smart has furnished me with one or two illustrations that I requested, but doesn't have a glossy print of Fig. 3 showing the cross section of the furnace that he could furnish me. He suggetsted that I write to you and at the same time secure your permission for using this figure.

M. L. BEGEMAN
Professor, Dept. of Mechanical Engineering
University of Texas
Austin

You have our permission to use this material, and the drawing has been forwarded. This print is very popular and has just been returned to us by the Military Academy at West Point, who borrowed it a few weeks ago.—Ed.

Put in Plant Paper

Sir:

Your editorial, "The Cotton Wall," in the June 29 issue is so good that I am writing you for permission to reproduce it in our plant paper, *The American Eagle*, which is issued monthly, with full credit naturally to Tom Campbell and THE IRON AGE.

W. S. YAHN
General Manager
American Sterilizer Co.
Erie, Pa.

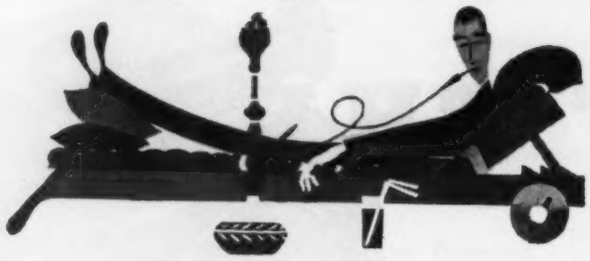
You certainly may have permission to reprint "The Cotton Wall." Many thanks for your kind remarks.—Ed.

All-Glass Pumps

In the September 1 issue of THE IRON AGE, I read with interest an article entitled, "Gas-Metal Reactions." In this article mention was made on p. 85 of the use of all-glass pumps magnetically driven. I would appreciate your furnishing me with information regarding manufacturers of this equipment.

A. D. MUIR
Research Fellow
Dept. of Engineering & Metallurgy
Ontario Research Foundation
Toronto

Your inquiry has been forwarded to the author, H. J. McDonald, for reply.—Ed.



Fatigue Cracks

By CHARLES T. POST

Ersatz

We suppose we're soon going to have to get used to synthetics all over again, but we never expected to see the day when the American Society for Testing Materials would be telling us about synthetic sea water, of all things.

But, believe it or not, Dr. T. P. May of International Nickel described "a substitute for natural ocean water for laboratory test procedures" before the ASTM's annual meeting last month.

Probably the delegates from Ottumwa, Indianapolis, and Nashville listened with great interest, looking forward to the day when mass production would enable bracing surf bathing on a municipal artificial beach. But, of all places, where do you suppose the ASTM convention was convened as the secrets of *synthetic* sea water were being revealed?

Atlantic City, N. J.!

Papa in the Breech

The editors of your f.f.j. have much to offer besides brains. Not a few are model husbands and fathers.

Eugene J. Hardy admits the nation's capital is keeping him hopping right now, but not half so much, he says, as a few weeks age. When Mrs. Hardy went to the hospital for her second date with the stork, Gene allowed as how he could keep the home fires burning, dishes washed, and laundry done before and after office hours, thus requiring only a daytime sitter for the No. 1 infant. Mrs. H., tired of hearing Gene expound on what a cinch housekeeping was, took him up on it.

It wasn't so tough at that, claims the Washington bureau chief. By a carefully planned routine, he got up with the birds, tossed the diapers and shirts in the washer, gave the house a quick dusting, bathed and dressed the toddler, got breakfast for both, hung out the laundry, turned things over to the sitter, and reached his office in the National Press Bldg. not much later than usual.

The only hitch came at an early morning press conference at the Pentagon. As the Big Brass began to talk, Gene whipped out his notebook, reached down to his vest pocket to unclip his pencil. His hand unclipped, instead, three clothes pins.

Puzzler

At the time we ran the "How old is Ann?" puzzle we frankly acknowledged that the puzzle was considerably older than Ann, but we never suspected an international background. But J. Charbonnier of Angouleme, France, came up with the answer ("Am I right or is there a different computation of girls' ages in the U. S. A. than in France?" he wrote) and tossed this one right back across the water:

"The same puzzling girls (Ann and Mary), three of their friends (Evelyn, Elen, and Maud), and their five mothers (Mesdames Barnes, Black, Jones, Robinson, and Smith) went shopping together. Each person bought one piece of fabric, and each a different one. The price (in cents) of one yard of each fabric was, by coincidence, precisely equal to the length (in yards) of that fabric bought by the corresponding person. Moreover, each mother paid exactly $4.05 more than her own daughter. Now listen attentively: Mrs. Jones paid more than any other person. Elen bought 11 times less fabric than Maud and Mrs. Robinson's daughter paid $2.88 less than Evelyn. Mrs. Black paid about four times as much as Mrs. Robinson and bought 16 yd more than Mrs. Barnes. Finally, Mrs. Smith bought 31 yd more than Mary. What is the family name of Ann?

MACHINE TOOL High Spots

Sales Inquiries and Production

By W. A. LLOYD

Shades of '39—An atmosphere vaguely reminiscent of 1939 pervaded the machine tool industry this week.

Sales departments in some segments of the industry reported the best business of any month this year to date. One company reportedly booked more new firm orders during the past 2 weeks than during all of June.

Production men, faced with perhaps the biggest backlogs of the past 4 years, are weighing additional manpower requirements and in several plants are considering the possibility of a 6-day week.

Ripe Time for Orders — Very little of this activity stems from government contracts. On the other hand, the situation in Korea has apparently helped a substantial number of customers to make up their minds in placing business that has been dangling for the past 90 days or longer. It is also indicative that industry, by and large, has realized that now is the time to get plant and equipment in order.

In Detroit there is some evidence of a machine tool buying speedup. In part this is prompted by the war threat. Another factor, of course, is the threat of increased prices.

Priorities by Phone — Trade sources have reported that several machine tool buyers here are using verbal orders, sometimes placed by top executives, as a basis for establishing a priority on machine tools that will be needed within the near future.

Other sources have reported a sharp upturn in machine tool buying by small shops. Presumably, the threat of war and higher prices may be inspiring some of this buying.

Otherwise the machine tool market here is active but orderly. There is little evidence of change in the long range tooling plans of any of the top auto makers. However, it is recognized that a number of developments in the field today could easily result in a quick overturn of existing plans.

Prophecy on Orders — Elsewhere, a spokesman for a major machine tool company predicted this week that requirements for war material as a result of the Korean campaign will probably snowball.

"Our schedule for the first quarter of next year doubles what we have been doing. If the phantom orders were activated, it would take us a year to build the machines and 18 months to return to our wartime peak," he said.

Shift Production Site — In Cleveland, Warner & Swasey Co. is shifting production of its Gradall road building and excavating machine from Cleveland to New Philadelphia, Ohio, according to Charles J. Stilwell, president of Warner & Swasey.

He said the shift is being made because of the need for less expensive plant space for the manufacture of the machine. The space vacated in the Warner & Swasey plant in Cleveland, will be used for production of machine tools and textile equipment, which produce more sales revenue per sq ft of space required.

To Absorb Work Force — Employees in the Gradall division in Cleveland will be assigned to other manufacturing departments, and about 125 will be employed at the New Philadelphia plant, where production is scheduled to begin about August 15. Warner & Swasey has been building 10 to 15 Gradalls a month and plans call for doubling this output in 1951.

The New Philadelphia plant was formerly occupied by the American Sheet & Tin Plate Co. It was purchased by the New Philadelphia Building Corp., and is being leased to Warner & Swasey.

Control Changes—In Cincinnati, control of the Columbia Machinery & Engineering Corp. of Hamilton, Ohio, producers of hydraulic shears, presses and other heavy machinery, has been acquired by a group of New York business men headed by John Queen, formerly associated with Allis-Chalmers. Amount involved in the transaction was not disclosed.

Columbia Machinery had a volume of about $5 million in 1948, and $2 million in 1949. Mr. Queen succeeded John C. Hart, of New York, as president. Merton Wilcox remains as general manager. Those acquiring control include James Walsh, William Thompson and Fred Schwartzerbach, of New York.

FREE — USE POST CARD

PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Accurate Couplings

Gleason Curvic couplings, developed to meet the need for permanent couplings and releasing couplings (clutches) requiring extreme accuracy and maximum load capacity with a fast rate of production, are described in a new 12-p. booklet. Various applications are shown, together with method of manufacture and general design features. Information on types of couplings available is given. *Gleason Works.*

For free copy insert No. 1 on postcard, p. 37.

Air Control Valves

In addition to revisions on dimensions and functions, a new 44-p. catalog shows construction features of the complete line of Logan air and air control valves. Typical circuit diagrams showing suggested applications of air control valves are presented, and a section is devoted to electronic control switches and air accessories. *Logansport Machine Co.*

For free copy insert No. 2 on postcard, p. 37.

Welding Library

In answer to many requests for information on published works in the welding field and those fields contributing to the art and science of welding, a circular has been issued entitled "Holdings of the A. F. Davis Welding Library." This list of titles is not meant to be a complete bibliography of the field but is published to assist corporations, individuals and other libraries in using the Davis Library or in building their own collections. Another bulletin provides information on welding patents to industrial organizations and educational institutions. *Ohio State University.*

For free copy insert No. 3 on postcard, p. 37.

Cleaning Stainless Shown

Choice of finishing technique for stainless steel should in all cases be established by experience. General rules for good finishing practice which apply to most conditions are offered in a new 12-p. booklet. Information is presented on cleaning, pickling tanks, racks and heating, degreasing, passivating and stripping, grinding, polishing and buffing, electrolytic polishing, blackening, carburizing, nitriding and chromium plating, as related to the stainless steels. *Atlas Steels Ltd.*

For free copy insert No. 4 on postcard, p. 37.

Hydraulic Presses

A new 24-p. bulletin is designed as an aid in determining the usefulness and economy of Birdsboro hydraulic presses in various manufacturing processes, and for planning the specifications and selecting the proper type to meet specific press requirements. Presses shown are particularly adapted to drawing and forming, coining and embossing, blanking and piercing, combining hydraulic press functions with the improved Birdsboro controls. *Birdsboro Steel Foundry & Machine Co.*

For free copy insert No. 5 on postcard, p. 37.

Redesigned Heaters

The line of Airtherm direct-fired heaters has been redesigned to change output capacities. The redesigned line, described and illustrated in a new catalog, consists of 9 sizes ranging from 650,000 to 2 million Btu. These oil or gas fired industrial type space heaters may be had for heating only, or with dampers and filters, for heating or ventilating. *Airtherm Mfg. Co.*

For free copy insert No. 6 on postcard, p. 37.

Versatile Bender

The Di-Acro Hydr-Power bender, designed to provide simple, trouble-free performance in a variety of operations, is described in a new data sheet. Simple, compound and reverse bends can all be formed in a multitude of materials, as outlined in the literature. Production examples are shown. *O'Neil-Irwin Mfg. Co.*

For free copy insert No. 7 on postcard, p. 37.

Recessing Tools

Maxwell recessing tools for grooving, recessing and back facing are described in a series of data sheets. These tools are adapt-

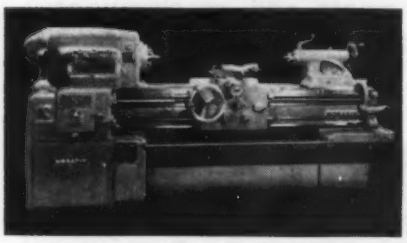
Turn to Page 125

definite point rather than an edge as is found on a diamond tip. These pencils are used for identifying sealed vials of standard colorimetric samples, accurately scoring glass sheets, tubes and rods for breaking, and other laboratory and commercial uses. The tungsten carbide point is permanently mounted in a knurled steel pencil shaft and is protected by a cap so the pencil may be safely carried in the pocket. *Fisher Scientific Co.*

For more data insert No. 23 on postcard, p. 37.

Toolmaker's Lathes

This 20-in. toolmaker's lathe is one of a new series of engine and toolmaker's lathes having both gear box and end gearing totally enclosed, automatic pressure lubrica-



tion, and heavy sided jaw clutches for quick speed changes. Also available are 14 and 16-in. sizes. More efficient transmission of power is claimed since the extra width shaved tooth helical gears offer a larger tooth contact than normal. Automatic pressure lubrication is provided not only to the gear box and end gearing, but also to the headstock, apron, carriage bearing on the ways and compound bottom slide on the carriage. All bearings are of the anti-friction type. *Monarch Machine Tool Co.*

For more data insert No. 24 on postcard, p. 37.

Adjustable Dock Board

Three-way adjustments solve handling problems.

Vertical, horizontal, and lateral movement are possible through use of a new adjustable dock board. This dock board has a range of 24 in. vertical, 14 to 24 in. horizontal, and 4 in. lateral movement. The main motive power is developed from two hydraulic cylinders, one

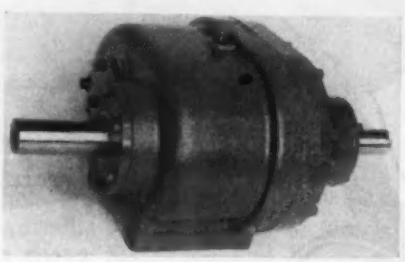
for vertical and one for horizontal. The lateral movement is supplied by a flexible channel ramp construction. This assembly helps solve the many problems encountered in: (1) The servicing of both truck and freight car loading; (2) the compensation for the variation of levels between dock and freight car or truck; (3) the opening and sealing of outer doors when not loading; and (4) the positioning of the last part of the load. *Beacon Experimental & Engineering Co.*

For more data insert No. 25 on postcard, p. 37.

Automatic Transmission

Machine tool control achieved by two-speed, 20-hp transmission.

This two-speed automatic transmission of 20-hp capacity, with minimum input speed of 900 rpm, has general application to machine tool controls and is adaptable to



all types of special machinery in the process and service industries. The mechanism in this unit consists of two over-running clutches, one engaging in a clockwise and the other in a counter-clockwise direction. They are so arranged that by reversing the motor, two speeds are provided, one at direct motor speed and the other at a pre-selected reduction, without changing direction of rotation of the output shaft. Motor control is accomplished by means of a push button, limit, and timing switches. The low limit of reduction is 6 to 1, but any pre-selected ratio from direct motor speed to this low limit is obtainable. *Western Mfg. Co.*

For more data insert No. 26 on postcard, p. 37.

Wire Rope Cutter

Self contained, hand powered unit cuts ¾-in rope in 30 sec.

Any type and size of wire rope up to and including ¾-in. diam can be cut on a new 18-lb wire rope cutter. Machine is 12x3½x6 in., hand

powered, self contained, requires no outside power or additional tools, and can be used in any position. It can even cut wire rope under water. *Pell Cable Cutter Co.*

For more data insert No. 27 on postcard, p. 37.

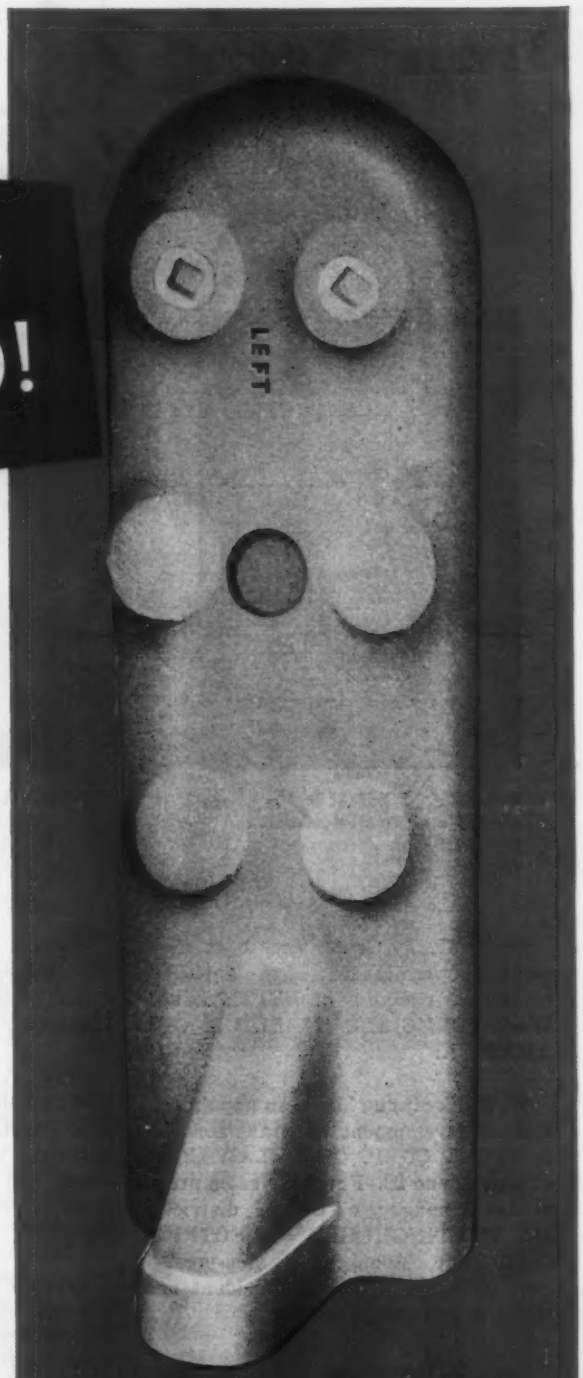
Milling Machine

Tracer control reduces machining hours for dies, molds and parts.

A new automatic electric tracer control on the Keller BL enables the tracer to glide smoothly over any contour two to three times faster on finishing operations. The control includes a new automatic tracer which, operating in conjunction with an automatic variable speed control, provides continuous variation of the individual machine motions in proportion to the slope being followed. New drive units for the vertical, horizontal, and transverse movements have an increased range of

Turn to Page 127

THIS CASTING SAVED $12,000.00!



Why an Electrode Holder, redesigned by National Bearing Division, lasted over 73 times longer

A large Midwest plant was getting 5 days service from furnace electrode holders . . . before a trial order was placed with National Bearing Division. This plant saved dollars—*right from the start.* A special copper alloy permitted sound, dense castings at no sacrifice in electrical conductivity. Result? *30 days service—instead of 5—before replacement.*

On the next order, National Bearing Division engineers submitted a new design for the clamp—for greater strength and resistance to cracking. The redesigned electrode holders are still in use—after a year of trouble-free operation! They've saved $12,000.00 on replacement costs and furnace maintenance.

Better, longer-lasting non-ferrous parts can save money in your plant or product . . .

National Bearing Division has complete facilities for finding practical, economical solutions to non-ferrous bearing and casting problems. Investigate these complete facilities—whether your problem requires designed engineering service, or production of non-ferrous parts to your own specifications.

If you design, specify or purchase . . . this catalog will interest you

Find out how complete facilities for Research, Engineering and Production can reduce costs of non-ferrous parts in your plant or product. Write for a free copy of this catalog.

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NATIONAL BEARING DIVISION

4923 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

Iron Age *Introduces*

CHARLES SCHRIBER has been elected a vice-president and director of Erle M. Jorgensen Co., Los Angeles.

OSCAR S. SWANSON will become works manager of Niles Steel Products Div., Republic Steel Corp.

CHARLES R. BEESON has been appointed vice-president of Ohio Stainless & Commercial Steel Co., Cleveland.

David H. E. Center has been appointed superintendent of the agricultural departments of the Midland Works, CRUCIBLE STEEL CO. OF AMERICA.

W. B. Montague has been appointed market development assistant for U. S. STEEL CORP. OF DELAWARE, effective June 22. Formerly sales promotion manager, central district, of WESTINGHOUSE ELECTRIC CORP., Mr. Montague is vice-president of NIAA and past president of NIAA'S Pittsburgh chapter.

Louis R. Botsai was made manager of the motor and control division, Buffalo, of WESTINGHOUSE ELECTRIC CORP. He succeeds **Leon R. Ludwig,** appointed a member of the executive staff.

Tom Maston will take charge of KEYSTONE STEEL & WIRE CO. industrial sales in Indiana and southwestern Ohio including Cincinnati, while **G. Wayne Bruce** was promoted to industrial sales representative in lower Michigan.

Philip S. Klaesson is now manager of the Chicago warehouse of SUPER STEELS, INC., Cleveland.

Donald Dingwall has been named Chicago representative for the WELLMAN BRONZE & ALUMINUM CO., Cleveland.

John T. Gossett has resigned as vice-president of INLAND STEEL CONTAINER CO. **William G. Caples,** industrial relations manager of Inland Steel, will be in charge of the container company as acting vice-president.

Frank F. Malcher becomes superintendent of the Cleveland plant of TRUSCON STEEL CO., while **J. Carl Reik** will succeed Mr. Malcher as works accountant.

O. Ivan Lee has joined the staff of UNITED STATES TESTING CO., INC'S main laboratories in the capacity of chief spectrographer.

J. Warren Shaver and **William Whigham, Jr.,** have been appointed assistant vice-presidents, industrial relations, of CARNEGIE-ILLINOIS STEEL CORP.

New district sales managers of TURCO PRODUCTS, INC., are **J. Charters,** northern California sales district and **Chris Williams,** Texas division district sales manager.

Appointments made by SYLVANIA ELECTRIC PRODUCTS, INC., include **Robert L. McNelis,** distributor sales representative, **Justin J. McCarthy,** special sales representative and **John A. Wood,** member of distributor sales staff.

J. M. Bertotti was named assistant sales manager and **R. G. Brierley** has been appointed manager of training for CARBOLOY CO., Detroit.

Robert N. Harwood has been named general manager of the Edgar T. Ward Div. of SOLAR STEEL CORP., while **John B. Briggs** becomes manager of the firm's Philadelphia office.

J. K. Sutter has been appointed Pittsburgh district manager for the Spang-Chalfant Div. of the NATIONAL SUPPLY CO.

Irving M. Malsch becomes Chicago district sales manager replacing **Carl P. Quanz** for BRIDGEPORT BRASS CO. **David L. Nesler** was appointed Indianapolis district sales manager, replacing Mr. Malsch.

Harlow F. St. Pierre, formerly assistant sales manager, has become manager of the industrial castings sales division of HUNT-SPILLER MFG. CORP., Boston.

E. E. Radcliffe is now associated with the REID AVERY CO., INC., Baltimore, as a specialist on submerged melt welding. He was formerly with the Unionmelt Div. of UNION CARBIDE & CARBON CORP.

John F. Gordon was appointed vice-president of GENERAL MOTORS in charge of the engineering staff. He succeeds **James M. Crawford,** who is on a disability leave of absence. **Don E. Ahrens** succeeds Mr. Gordon as general manager of the Cadillac Div.

Dr. Gerald F. Tape, formerly associate professor of physics at the University of Illinois, has joined the scientific staff of BROOKHAVEN NATIONAL LABORATORY to assist **Dr. Leland J. Haworth,** director, with the overall scientific administration of the laboratory.

Harry J. Mokate became affiliated with DUMAS STEEL CORP., an affiliate of M. G. DUMAS & SONS, in the capacity of general manager of sales.

Andrew E. St. John has been appointed to the sales and engineering staff of BARTH SMELTING CORP., Newark, N. J.

W. Jack Develin has been appointed consulting engineer to head the engineering and sales of the solid steel belting department of METAL-SMITHS, division of ORANGE ROLLER BEARING CO., INC.

James W. Birkenstock was appointed executive assistant at the New York world headquarters of INTERNATIONAL BUSINESS MACHINES CORP.

EDWARD V. MELSHA has been elected president of Vulcan Iron Works, Wilkes-Barre, Pa.

Iron Age Salutes

IRVING S. OLDS

HE has a soft voice. His manners are of the best. But his mind is a steel trap. If he feels like getting mad for a righteous cause he does. Yet you would hardly know it because he keeps himself under such good control.

Irving S. Olds of U. S. Steel has to take a lot of the blows against big business. One would not know to look at him, to hear him or to visit with him, that he is busy on a wide front all the time seeing that his firm gets a square break.

He and his staff have done a great job in getting the facts about U. S. Steel and the industry across to the public, stockholders and employees. The going has not been easy. Nor does he think it ever will be.

But that does not bother the chairman of the board of this steel company. He has the respect of newsmen, his employees and the stockholders. If they disagree, they know they have ample opportunity several times a year to shoot any questions at him. He will meet the issue and has met it no matter whether it be a question from newsmen, a letter from the public, an irate missive from a stockholder or a gripe from an employee.

His idea is that this is his job; it's what he is supposed to do; and he does it. His law training and experience have made him a top level lawyer—in matters that concern the fight of business to live and compete. His own personality is such that he blends the counsel table or courtroom atmosphere with a human touch.

One of his recent triumphs was the presentation of testimony of U. S. Steel officials before a monopoly hearing in Washington. The way this was presented to the public and the stockholders is a milestone in his continuing success in public relations—the job for which Mr. Olds must be responsible.

It was also a foil to those who would extend government control in American business. They are beginning to find out that their attacks will be met, their accusations will be answered and that the steel industry has a good case which it can effectively present — even on short notice.

Irving Olds is an important part of that case. Though his mind is a steel trap, his personality is quiet and human. Most of the time he is characterized by a warm smile that wins friends wherever he goes.

GEORGE L. STEWART was appointed manager of the Hammond plant, W. J. Holliday & Co., Indianapolis.

S. S. CORT is the new assistant general manager of sales, Bethlehem Pacific Coast Steel Corp.

WILLIAM R. SANDBERG was named general sales manager, Phoenix Mfg. Co., Joliet, Ill.

Dr. Paul E. Burchfield has been appointed director of technical service, WYANDOTTE CHEMICALS CORP., Michigan Alkali Div., Detroit. Dr. Burchfield succeeds **Charles S. Johnson,** who is retiring but will continue to serve Wyandotte in an advisory capacity.

George P. Thomas, Jr. has been elected vice-president of the THOMAS MACHINE MFG. CO., Pittsburgh. He will continue in his current capacity as purchasing agent.

Landis O. Morris, Jr. has been assigned to the staff of Robert S. Tyler, Jr., manager of the Tulsa, Okla., office of TUBE TURNS, INC.

V. J. Gillis was made Canadian regional manager of NASH MOTORS. He takes over the post held by **J. E. Lamy,** who will now devote his entire time as central regional manager in the U. S.

Edward C. Hoenicke, general manager of EATON MFG. CO. Foundry Div., Detroit, has been elected a vice-president and trustee of the GRAY IRON RESEARCH INSTITUTE.

F. J. Murphy, formerly production manager of the Chattanooga division of COMBUSTION ENGINEERING-SUPERHEATER, INC., was named general purchasing agent, **B. A. Anderson,** production manager and **Myron E. Freeman,** manager of the service and erection department.

Henry W. Hunsberger was appointed metropolitan sales representative of the twine division, PAULSEN-WEBBER CORDAGE CORP.

W. Scott Hill joined GENERAL ELECTRIC'S apparatus department as manager, commercial engineering division.

Frank H. Hughes was appointed director of purchases for AMERICAN NATURAL GAS SERVICE CO.

Dr. J. A. Hutcheson, director of research, WESTINGHOUSE ELECTRIC CORP., will become chairman of the committee on ordnance, Research and Development Board of the Department of Defense.

Paul Codman Cabot has been elected a director of the B. F. GOODRICH CO.

Erling Klafstad was appointed assistant director of engineering for MANNING, MAXWELL & MOORE, INC., Bridgeport, Conn.

H. W. Gouldthorpe has been appointed manager of GENERAL ELECTRIC'S transportation divisions in Schenectady. **J. H. Gauss** was named manager of sales for the divisions.

James L. McFarland has been appointed manager of engineering of the GENERAL ELECTRIC CO'S Schenectady industrial heating engineering division.

Bert M. Meadow, president of the BIRMINGHAM ORNAMENTAL IRON CO., has been elected president of the National Association of Ornamental and Miscellaneous Iron Manufacturers.

Jesse L. Powers was promoted to general superintendent on special assignments at the Buick Motor Div., GENERAL MOTORS CORP. He will be succeeded as plant superintendent by **Stanley White. Jerry B. Doll** was named superintendent of the service parts manufacturing plant, succeeding **T. J. Johnson,** who recently retired.

Harold S. Hoover was appointed director of public relations for the TRAILMOBILE CO.

Basil M. Graham has resigned as president of CENTRAL IRON & STEEL CO., PHOENIX IRON & STEEL CO., and PHOENIX BRIDGE CO., subsidiaries of BARIUM STEEL CORP. **James E. Jones** was elected president and treasurer of CENTRAL IRON & STEEL CO. **Irving M. Smith** was elected assistant secretary and assistant treasurer and **Frederick Steuber** has been appointed general manager of sales.

Leland Harold was named assistant chief engineer, ore mines and quarries division, for TENNESSEE COAL, IRON & RAILROAD CO.

OBITUARIES

Dr. Trygve D. Yensen, 66, whose retirement from Westinghouse Electric Corp. was announced in the July 13 issue of THE IRON AGE, died from cancer on July 2 in Scotland. He had been enroute to his native Norway.

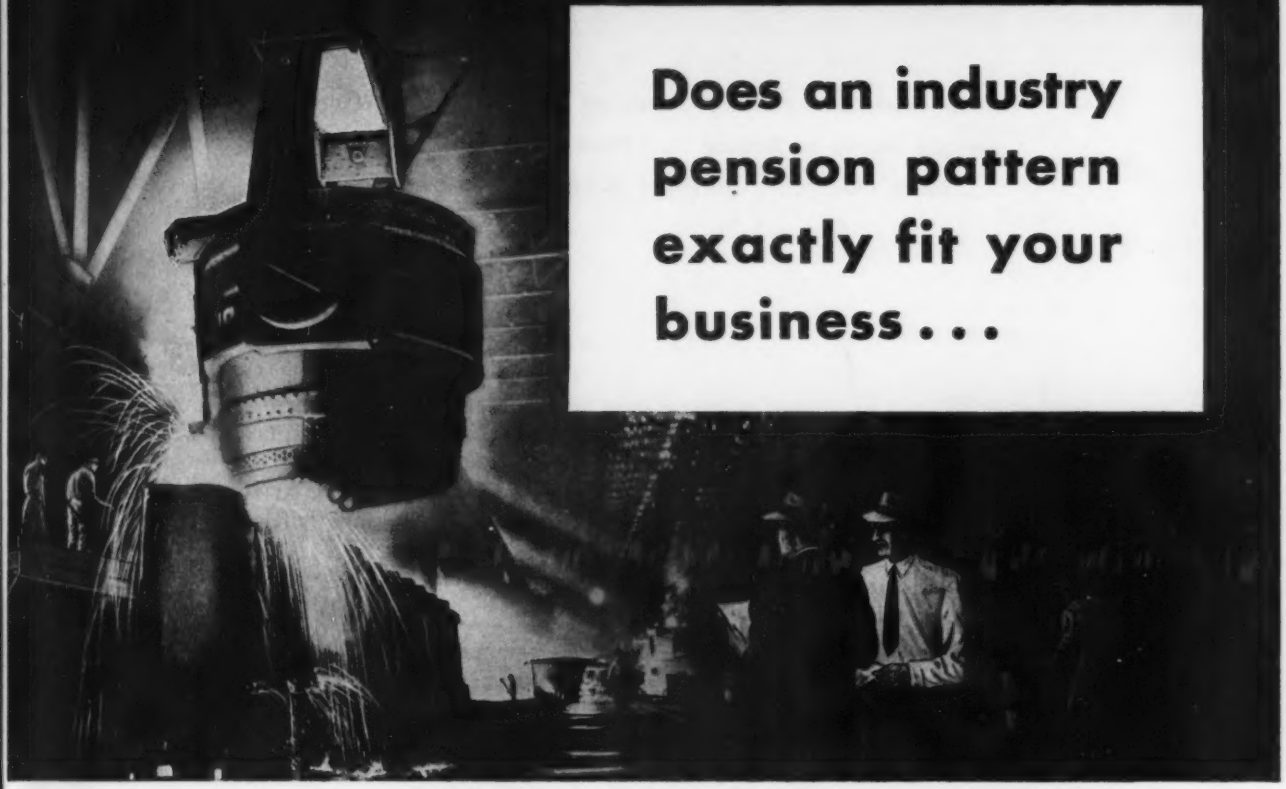
Frank P. Barnes, superintendent of manufacturing of the Dodge Div., Chrysler Corp., passed away recently.

Thomas J. Woeber, 51, chief of appropriations, control section, National Tube Co., died July 6.

Gaston Marque, director of public relations, Studebaker Corp., South Bend, died recently enroute from Chicago to New York.

William C. Fownes, Jr., 72, builder of several steel mills in the Pittsburgh area and an organizer of the Shamrock Oil & Gas Co., Amarillo, Tex., passed away on July 5.

Patterns in Pensions



Does an industry pension pattern exactly fit your business . . .

. . . or will variations within the pattern mean a better pension plan for your company?

BEFORE you adopt a pension plan based on an industry pattern investigate all variations that can be made within the pattern. You may find that even a slight departure from the industry pattern will enable you to develop a pension plan better fitted to your business and employees.

The accumulated knowledge gained by our Pension Trust Division through years of pension experience is available to you. We shall be glad to estimate the cost of a pension plan for your company or to discuss with you any pension problem you may have. No obligation whatever.

Write or call the City Bank Farmers Trust Company or The National City Bank of New York. Ask for our Pension Booklet.

We act as trustee under pension plans and as agent for individual trustees.

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On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Auto assemblies roll out 4 million in 1950 . . . New model parade starts in August . . . Face-lifting will predominate . . . More electronic conveyer developments awaited

By WALTER G. PATTON

Flying Start—Whatever may be the fate of auto production schedules in the months ahead, the automakers have gotten off to a start in 1950 that has surpassed the dreams of even the most optimistic executives in the industry. Last week the industry turned out its 4 millionth 1950 model vehicle.

This record was accomplished, of course, in a much easier steel market than exists today and was made prior to the outbreak of hostilities in Korea.

August a Record?—Ward's estimates last week's auto output topped the 200,000 mark. Daily output in most plants is being held at top levels. Variations in monthly output come about mostly from fewer working days in the month or steel shortages.

Barring interference by government allocations and assuming adequate steel availability, August production will come close to all-time record production based on present output projections.

Face-Lifting Mostly—New model time is here again. Changes this year will be predominantly face-lifting with only minor body changes. Here is the outlook as of this week—but it should be kept in mind that unforeseen developments in the steel market or in the Far East could change this picture almost overnight.

Studebaker—Changeover expected in October or later. A new V-8 high compression engine is coming for the Commander. Not many body changes anticipated. Studebaker automatic drive is expected late this year.

Nash—New body styles for the Rambler line are due late this year and 1951 changeover for other lines is set for August. Extensive body changes are anticipated plus the usual grille, bumper and trim restyling.

Hudson—Changeover expected during August. Limited body changes, including alterations of roof lines and pillars to give greater visibility. The rumor about GM Hydra-Matic transmissions on 1951 Hudson persists.

Packard—A completely restyled body with less curvaceous lines. Probably the most complete restyling in the industry. New engines will come later, if at all.

Kaiser - Frazer—Kaiser's 1951 model, just hitting its stride, has been pinched by the Borg-Warner strike. Henry J is just getting into production. K-F has great hopes for this new entry which has had a good public reception.

General Motors—The first 1951 GM models are expected in December. Cadillac may lead the parade with Buick a close second. Chevrolet, Oldsmobile, Pontiac and Cadillac will be face-lifted only.

Ford—The new 1951 Ford and Lincoln models are expected early in October. Mercury will come later.

Chrysler—Plymouth is reported to be well set for the changeover, but other Chrysler divisions are lagging. Reports indicate Chrysler divisions are shooting for November introduction. A torque converter transmission is expected some time next year. New V-8 high compression engines will not be ready until 1952.

Conveyer Electronics—Electronic controls are playing a big part in modern conveyer lines. One installation, dubbed Grand Central Station, weighs and sorts

out appliances automatically on nine different rail sidings.

The completed appliances travel around the plant until they find their assigned shipping destination. Switching is fully automatic. Some fancy new conveyer developments are coming soon in several Detroit auto plants.

Multi-Slot Tire—U. S. Rubber's new low pressure, Fisk Safeti-Flight tire utilizes the multi-slotting principal. The new tires have 3000 slots across the tread face and 64 sharp ridge edges around the tread face.

According to U. S. Rubber engineers, when brakes are applied the slot edges break up road film and sweep it aside, giving improved stopping characteristics. The new tire also features a non-scuff guard as protection to sidewalls.

Three-Wheeler Line—Resourceful Reo, at Lansing, plans to stabilize operations in its lawn mower division by producing tricycles and toys. Reo is now the world's largest producer of lawn mowers. The company recently received a large U. S. Government order for new trucks.

Willys Order—Wilson Foundry at Pontiac will make all of the blocks, heads and manifolds for Willys-Overland's new $22 million government order. The order represents an entire month's production.

More Steel Per Unit—Today's record-breaking auto output is not the only reason why steel is scarce. Per unit, autos require much more steel today than they did a few years ago. For example, the 1950 Chevrolet weighs 500 lb more than the 1929 model. Using the rule of thumb that gross steel purchased for a car and service parts is about equal to the curb weight of the car, this would add about 500 lb to the gross steel requirements per car.

Steel Consumption—Speaking of Chevrolet and steel, the leading auto producer required 1,689,000 tons of steel during the first half of 1950 when 1,002,846 cars and trucks were built. Including service parts, this figures out to about 3400 lb of steel gross required for today's Chevrolet.

Allegiance Pledge — The day when the communist element dominated big Ford Local 600 seems to be at an end. Henceforth, all officers and representatives of Local 600 must take non-communist oaths.

In part, the oath states: "I am not a member of the Communist party, Fascist party or Ku Klux Klan, nor do I support the policy or the program of Soviet Russia and its satellite nations, nor will I distribute any leaflets, or other form of petitions in favor of such policy or program."

Nash NXI Waits—Nash's NXI $1000 car may yet go into production—but not until steel is more plentiful. George W. Mason, Nash's president, has made it clear that his company is still watching this development carefuly.

On the basis of suggestions made by customers, the tread and wheelbase have been increased. A three-place front seat replaces the two-place seat. Nash still plans to keep the NXI price within the $1000 limit. The company is carrying forward its engineering on the car up to the point of tooling for production.

Contest — A record number of model cars, designed and built by teen-age boys have been entered in the Fisher Body Craftsman's Guild contest which ended at midnight July 1. Cash award and university scholarships aggregating $65,000 will be given to the winners.

Judging began July 5 in the General Motors Bldg. where the models will be on display until September 2. Winners in state contests will be matched against other state winners and 40 regional champions will be given expense-free trips to the Guild convention in Detroit late in August.

THE BULL OF THE WOODS — By J. R. Williams

WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT

Ghost Walking — West Coast shipyards that became idle soon after the end of the last war show signs of life as reactivation of moth-balled ships begins.

Fifteen of the famed Victory ships which have been tied up in the Pacific Northwest and the San Francisco Bay area have been released to shipyards for re-commissioning—seven from the Astoria and two from Olympic, Wash., berths and five from the San Francisco Bay area.

Back to the Sea—The San Francisco yards of Bethlehem Pacific Coast Steel Corp. is engaged in reactivating three of the Victories under forced draft. More than 500 employees have been added within the past 2 weeks to expedite this work. One tanker has already been put back into service here. This operation requires a week to 10 days. Todd Shipyards, Alameda, has two Victories for recommissioning and the Moore Drydock in Oakland is working on two tankers.

Two 7000 ton escort carriers of the Pacific Reserve Fleet are being taken out of moth-balls in the Pacific Northwest. The Cape Esperance is being handled at the Bremerton Navy Yard in Seattle and the Sitkoh Bay is being reactivated at Tacoma.

Aircraft Angle—Air-frame manufacturers in the West are not talking about war-stimulated orders but in both Seattle and southern California there is evidence of a stepping up in production. In Seattle, Boeing Airplane Co. last week advertised for 100 skilled machinists after having trimmed its payroll by more than 8000 persons during the past year. Expected July cutbacks in employment scheduled are being held off and in general there is a tendency to hold on to experienced help as the labor market is growing considerably tighter. Boeing has been requested by the Air Force to make some proposals on various types of work it has done, but no new military commitments have been made.

Ready and Waiting—A clue to aircraft production in the numerous southern California plants lies in the activity of the hundreds of small industries which supply parts to aircraft producers on subcontracts. A check of a representative group of these suppliers shows no marked increase in orders but a readiness and ability to expand should increased demands make that desirable.

Aluminum Key—That aircraft plants have not as yet received any exceptionally large emergency orders from the military is indicated by aluminum producers in the Pacific Northwest who report no production orders for that purpose.

Although the Trentwood, Wash., rolling mill of Kaiser Aluminum & Chemical Corp. is operating at full capacity on an around-the-clock basis, production for military use has not been increased as a result of the Korean war. The current high production rates in a normally dull quarter is attributed by Kaiser officials to an unprecedented and increasing use of aluminum by all industries.

People Make Markets—One example of the effect of rapidly increasing population on the western steel market are the highway improvements under construction. In the San Francisco Bay area alone more than 20,000 tons of structural steel is being used in over-passes on freeways.

The California State Department of Highways has purchased 8838 tons of structurals for the Bayshore Highway in San Francisco and 12,837 tons for the Eastshore Highway on the east side of San Francisco Bay.

Northwest Refineries — It has been announced that General Petroleum Co. proposes to build a $25 million oil refinery in the Portland area within 5 years to process crudes from Montana and Alberta, Canada, brought in by pipeline. No site has been selected as yet for the proposed plant which will employ approximately 500 persons.

Union Oil Co. of California has announced that it will build a $1 million asphalt refinery in Edmonds, Wash., to be completed in the middle of next year. Annual capacity is expected to be approximately 55,000 tons of asphalt. Oil for processing will be shipped from California by tanker.

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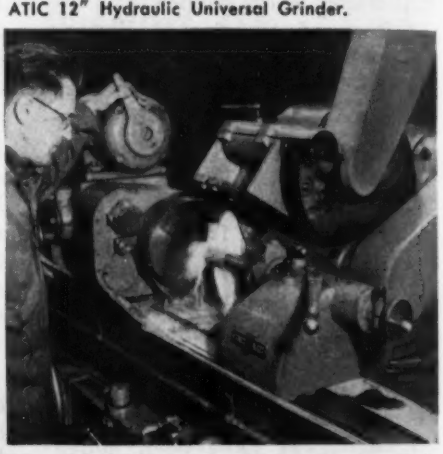

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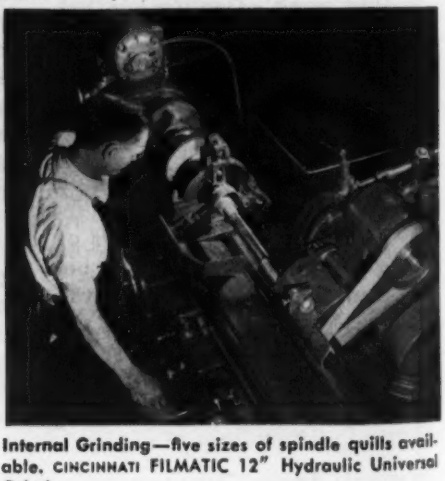

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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

By EUGENE J. HARDY

Mobilization Not Certain—Mobilization of the nation's resources on a partial or limited scale, or a continuation of the piecemeal efforts to meet the international responsibilities of the U. S.?

This was the major problem facing the Administration at publication time. The odds seemed to favor the former, although there is not too clear a picture of what this means. This is due almost entirely to the fact that the mobilization plans are in readiness and were based on all-out war.

More Military Orders—What appears to be in the wind is a substantial boost in orders for all types of military equipment. Present thinking would indicate that an attempt will be made to place such orders with plants best able to handle them, while leaving others free for civilian production within the limits of available materials. Affected industries would have an active part in any such allocation scheme.

Autos Indicate Planning—With the automotive industry occupying such an important position in regard to military production, tentative planning for this industry at the National Security Resources Board is a fair indication of the present line of thinking. The general feeling is that if the current fighting is confined to Korea there will be no special impact on the automotive industry.

Already four major producers—Reo, Studebaker, Willys and International—have substantial war orders. Outbreaks elsewhere in the world would require a quick re-appraisal, but the view is that even partial mobilization could be handled without too serious repercussions on the civilian economy.

Transportation Problems—The biggest weakness in the transportation picture is the freight car situation and talk of a 100,000-car program is being revived. A substantial shipbuilding and repair program is also in the wind. The international situation is likely to spur Senate action on a House-approved bill for modernization of six Great Lakes ore boats. The vessels are all that remain of 35 traded in to the Maritime Commission in 1944 and are scheduled for scrapping at the end of the current shipping season.

Senatorial Bloc—A powerful bipartisan bloc of 25 Senators is backing legislation that would order the repair of 134 auxiliary vessels in the reserve fleet.

These vessels include hospital ships, cargo attack vessels, provision ships and others. Cost is estimated at $25 million. The move has long had the backing of the Joint Chiefs of Staff who would like to see more than three times as many auxiliary vessels placed in condition.

Controls Still in Doubt—There is strong support within the Administration for a system of mandatory allocation and other controls and the President may still be won over. It would appear that in the present situation voluntary allocation of steel and other important commodities will probably be given a chance before trying more drastic measures.

Celler Decides Again—New legislation calling for controls will be introduced shortly by those seriously concerned and others playing politics. An example of the latter is Rep. Celler, D., N. Y., who has long wanted to break up the steel industry.

He has already decided that voluntary allocations won't do as did Fair Dealing Rep. Douglas, D., Calif. To offset this sort of thinking, which runs counter to all of the experience in 1948, a Republican move to get a standby voluntary allocations law on the books is now underway.

Powers at Hand—Legal opinion in Washington now leans toward the original interpretation of the priorities and allocation provisions of the draft act, that is, that in time of war they could be extended to cover the entire economy. The priorities provisions authorize priorities from "any agency" for "any articles or materials." While they could be put into effect immediately, they would precipitate the old 1941-42 priorities snarl which was finally broken up with the advent of the Controlled Materials Plan.

The allocations provisions affecting steel apply to military orders only, but as one procurement official told THE IRON AGE "in times of war the term 'military' is relative, since practically all activity is in support of the military." These provisions would not be practical in the event of all-out war, but they might have to be used. If time is available, present plans favor a resumption of something resembling CMP.

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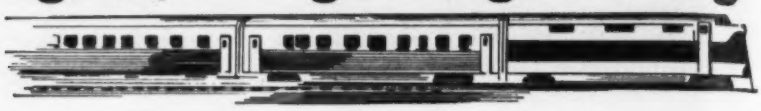

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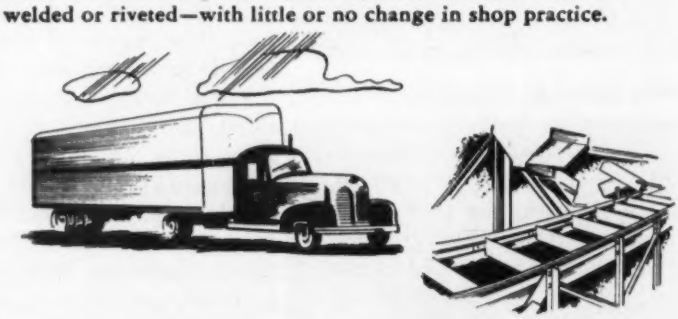

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COMPARISON OF AVERAGE PROPERTIES OF HI-STEEL WITH ORDINARY STRUCTURAL GRADE CARBON STEEL

Tensile Properties (¼" Plate)	Inland HI-STEEL	Ordinary Structural Grade Carbon Steel
Yield Point (psi)	56,000	35,000
Ultimate Strength (psi)	73,000	66,000
Elong. in 8" (%)	25	25
Endurance Limit		
Fatigue Strength (psi)	49,000	33,000
Impact Resistance (Charpy Impact—ft. lbs.) Temperature		
80° F	55	36
32° F	43	33
0° F	36	26
—25° F	34	6
—50° F	30	2

A Fast Analysis For

MANGANESE BRONZE

By C. GOLDBERG, Chief Chemist,
New England Smelting Works, Inc.,
West Springfield, Mass.

A single sample method for analysis of manganese bronze saves time, reagents and apparatus. Percentages of tin, lead, copper, iron, manganese, nickel, aluminum and zinc in samples can be accurately determined. Detailed step-by-step procedure outlines technique to be followed.

MANGANESE bronze samples are usually analyzed for copper, tin, lead, manganese, iron, aluminum and nickel. Zinc is taken by difference. The customary methods of analysis require considerable time because separate samples are used for tin, aluminum and manganese.[1] Also, the lead (usually determined electrolytically as lead dioxide) must be corrected for simultaneous deposition of some of the manganese as manganese dioxide.

The advantages of using a single sample for the complete analysis of manganese bronze are quite apparent. Raviner[2] proposed a scheme whereby copper, lead, tin, iron and nickel were determined on a single sample, manganese and aluminum being done separately. The method has the disadvantages of (1) requiring platinum ware, (2) working with an unpleasant reagent (hydrofluoric acid), and (3) not eliminating manganese contamination of the lead dioxide deposit. It would also be desirable to include aluminum and manganese determinations in the single sample. The saving in time, reagents and apparatus in single sample procedure prompted a study of possibilities in that direction.

Recent contributions to the field of manganese bronze analysis may be so modified as to make possible a working procedure whereby copper, tin, lead, manganese, iron, nickel, aluminum and zinc may be determined from a single sample. Briefly, the sample is dissolved with nitric acid and the tin filtered off as stannic oxide. The latter is dissolved with sulfuric acid, hydrochloric acid added, the tin reduced and titrated iodometrically. The filtrate from the tin oxide filtration is electrolyzed under conditions eliminating the interferences of manganese with the quantitative electrodeposition of lead as lead dioxide.[3] The lead dioxide and copper plates are weighed. The solution is then diluted to a definite volume and aliquots are taken for the colorimetric determination of iron, manganese, nickel and aluminum. Zinc is taken by difference.

The detailed procedure is as follows: Transfer a 1.00 g sample to a 150 ml beaker and add 15 ml cp nitric acid (50 pct). Cover the beaker and heat on the hot plate until the sample is completely dissolved and all nitric oxide fumes are

expelled. Add 100 ml hot distilled water and boil the solution 30 min, occasionally adding hot distilled water to replace the water that has boiled away. Add some paper pulp and filter the hot solution through an 11-cm #44 Whatman or similar filter paper. Wash the residue three times with hot 1 pct nitric acid solution. Transfer the filter paper to a 500 ml Erlenmeyer flask and add 15 ml cp concentrated H_2SO_4 of 1.42 sp gr.

Heat the flask over a hooded open flame until strong fumes of sulfuric acid are coming off. Continual swirling of the flask during heating will prevent spattering due to local overheating. Allow the flask to cool for 10 min. Carefully add 200 ml distilled water and 75 ml cp concentrated HCL of 1.19 sp gr. Add 10 g of a suitable reductant for tin, such as test lead, iron or nickel.[3] For reasons discussed elsewhere, the author prefers the use of 15 pct antimonial lead. Stopper the flask with a 1-hole rubber stopper containing a bent glass tube, the other end of the tube being set into a flask or beaker containing a saturated solution of sodium bicarbonate. Heat the solution in the flask to a boil and boil gently for 5 min.

Cool Before Titration

Transfer the entire assembly to a cooling tray and cool to approximately 10°C. Remove the rubber stopper, add some starch solution as an indicator and a few marble chips. Titrate immediately with 0.01 N iodine solution to a deep blue endpoint. The iodine solution should be prepared by dissolving 2.0 g cp KI in 50 ml distilled water and adding 1.2692 g cp I_2. Shake well to dissolve the iodine and dilute to 1 liter with distilled water. The theoretical titer of the iodine solution is 0.000595 g tin per ml. To determine the actual titer, dissolve weighed quantities of cp tin in 100 ml cp HC1 solution, 50 pct strength. Add 25 ml cp concentrated HC1 and 15 ml cp concentrated H_2SO_4, then add 60 ml distilled water. Reduce the tin and titrate as outlined above.

The filtrate from the tin oxide filtration is electrolyzed at room temperature and 2 amp. Its volume should be approximately 150 ml. Cover the beaker with a split watch glass to minimize spray loss. Agitation is essential. After 30 min add 1 ml of cp H_2SO_4, 50 pct strength, and 1 ml of 10 pct H_2NSO_3H (sulfamic acid). Continue the electrolysis until all copper has been deposited, as shown by failure to plate upon a freshly exposed portion of the cathode. With the current remaining on, remove the beaker and wash down the electrodes with a gentle spray of distilled water. Remove the electrodes and dry in the oven. The copper should be dried at 100°C for several minutes, the lead dioxide at 180° to 200°C for at least 30 min. Cool and weigh. The factor for lead in lead dioxide is empirical and should be determined for each laboratory. We use 0.8643. Under the conditions given above, manganese does not contaminate the lead dioxide plate. The average manganese content of more than 100 plates was less than 0.001 pct.

Take Colorimeter Reading

The solution, after electrolysis, is transferred to a 250-ml volumetric flask and diluted to the mark with distilled water. Mix well and pipette a 10-ml aliquot (5 ml for iron above 2 pct) into a 250-ml volumetric flask. Add 1 ml cp concentrated HCL and 25 ml of 10 pct KSCN (potassium thiocyanate) solution. Add 1 ml 3 pct H_2O_2 (hydrogen peroxide) solution. Dilute to the mark, mix well, and read on the colorimeter after 5 min at 525 millimicrons. The colorimeter scale reading is referred to curves prepared by taking weighed quantities of electrolytic iron or definite volumes of a standard solution of cp ferric nitrate through the above procedure.

An additional aliquot of 10 ml is pipetted into a 250-ml volumetric flask. Add 10 ml of 10 pct cp citric acid solution, then 1 ml of iodine solution (25.0 g of KI dissolved in 50 ml distilled water, 13.0 g of pure I_2 added and the whole diluted to one liter with distilled water), then 10 ml of cp ammonium hydroxide solution (1:1) and, finally, 6 ml of 1 pct alcoholic solution of dimethylglyoxime. It is important to add the reagents in the order given. Shake well and dilute to the mark with distilled water. Mix thoroughly and, after 5 min, read on the colorimeter at 525 millimicrons for nickel. The colorimeter scale reading is referred to a curve prepared by taking weighed quantities of cp nickel or definite volumes of a standard solution of cp nickel nitrate through the above procedure.

Bring Out Permanganic Color

Pipette a 25-ml aliquot (or 10 ml for manganese above 1.50 pct) into a 150-ml beaker and add 5 ml cp HNO_3 (1:1). Add 100 ml hot distilled water and 15 ml of 0.33 pct $AgNO_3$ solution. Add 3 to 4 g of cp ammonium persulfate and warm to full development of the purple permanganic acid color. Allow to cool to room temperature, transfer to a 250-ml volumetric flask and dilute to the mark with distilled water. Mix well and read on the colorimeter at 525 millimicrons for manganese. Refer the colorimeter scale reading to curves prepared by taking definite volumes of a standard solution of manganese (dissolve electrolytic manganese in nitric acid) through the above procedure.

Pipette a 25-ml aliquot (10 ml if the aluminum

is greater than 1.7 pct) into a 200-ml volumetric flask. Dilute to the mark with distilled water and mix well. Pipette a 5-ml aliquot of the 200-ml solution into a 100-ml volumetric flask. Make up the following solutions: (a) 10 pct benzoic acid solution in methanol, (b) a buffer solution made by mixing 470 ml of 29 pct ammonium hydroxide solution and 430 ml of glacial acetic acid. Cool to room temperature and adjust with acid or base to pH 5.25-5.35 when diluted 1 to 20. Dilute to 1 liter. Also, make up a 1 pct gelatin solution by dissolving 3 g of gelatin in hot distilled water and diluting to 300 ml. The composite aluminum reagent is prepared by dissolving 0.3 g of high purity aluminum in 200 ml distilled water and adding 60 ml of the benzoic acid solution. Dilute to 300 ml and add 300 ml buffer solution and 300 ml gelatin solution and shake. Let stand 3 days before using. The composite reagent is stable at least 2 months if stored in the dark.[4]

Scale Shows Reactions

Add to the 5-ml aliquot in the 200-ml volumetric flask 15 ml of the composite reagent. Place the flask in a water bath at 90° to 100°C for 10 min. Remove the flask and let stand at room temperature for 10 min. Dilute with distilled water to the mark and read on the colorimeter at 525 millimicrons.

The colorimeter scale reading is a measure of the iron and aluminum reaction with the organic reagent. Since the iron and aluminum colors are additive the known iron content is multiplied by 0.366 and that value, located on a standard aluminum curve, is deducted from the total scale reading. The remainder of the colorimeter scale reading is referred to the standard aluminum curve, prepared by carrying definite volumes of a standard aluminum solution (0.4 g pure aluminum dissolved in 10 ml 70 pct HNO_3, 5 ml 38 pct HCL, and 15 ml distilled water and diluted to 1 liter) through the above procedure.

Results, indicating the reliability and accuracy of the proposed procedure are shown in the accompanying table.

Because tin is not quantitatively precipitated as oxide when more than 0.25 pct iron is present,[5] it is necessary to boil the solution for the stated period of time.[6] The tin oxide precipitate cannot be directly used for the gravimetric determination of tin because oxides of antimony, arsenic and phosphorus may be present. Also, the residue retains, after washing, small but significant amounts of copper, iron and zinc.

The use of marble chips, prior to the iodometric titration of the reduced tin, minimizes the possibility of air oxidation. A starch solution found to be resistant to organic growth for long periods of time may be prepared by dissolving 2 g of "soluble" starch in a liter of boiling distilled water. Add 6 g of NaOH dissolved in a little water. Allow to stand 1 hr and neutralize with 50 pct HCL (litmus paper). Add 1 ml glacial acetic acid. When cool, it is ready for use.

The red color of the complex used for the colorimetric determination of iron is due to undissociated Fe (CNS)3. 9KCNS. $4H_2O$. Phosphorus interferes with the alkali thiocyanate colorimetric method for iron because of the formation of weekly ionized ferric phosphate. However, if the phosphorus content is known, its interference may be calculated and allowed for.[7] Hydrogen peroxide is used to prevent rapid fading of the red color.

The well-known nickelie dimethylglyoxime colorimetric method is both sensitive and accurate. A few erratic results were found to be caused by cloudiness in the citric acid solution, due to organic growths. The latter reagent should be freshly prepared each week and filtered when necessary.

The formation of permanganic acid may be accelerated, if desired, by allowing a piece of platinum to remain in contact with the solution.[8] The platinum anode used in the copper-lead electrolysis has proven convenient for that purpose.

RELIABILITY OF RESULTS

Sample	Cu	Sn	Pb	Mn	Al	Fe	Ni
B. S. 62b[b]	57.39	0.96	0.28	1.29	0.97	0.82	0.27
Single Sample Proc.	57.40	0.95	0.28	1.28	0.95	0.83	0.28
Mn Bronze #1[a]	58.50	0.40	0.18	0.42	0.21	0.71	0.05
Single Sample Proc.	58.52	0.41	0.18	0.43	0.22	0.73	0.05
Mn Bronze #2[a]	63.00	0.22	0.10	3.10	3.50	2.95	0.69
Single Sample Proc.	63.05	0.20	0.10	3.16	3.54	2.93	0.68
Mn Bronze #3[a]	59.04	0.62	0.29	1.20	1.05	1.10	0.33
Single Sample Proc.	59.08	0.63	0.28	1.22	1.07	1.10	0.35
Mn Bronze #4[a]	59.19	0.88	0.32	0.33	0.89	1.25	0.28
Single Sample Proc.	59.20	0.90	0.33	0.34	0.90	1.27	0.30

[a] Composition determined by regular methods—average of three determinations.

[b] Bureau of Standards certified values.

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APPLIED HYDRAULIC THEORY Improves Casting Technique

Controlling metal pouring to conform to the solidification rate has improved centrifugal casting output at Watertown Arsenal. It also applies to ingots and sand castings. For application, a knowledge of the basic hydraulic principles involved is essential.

By JAMES A. CLARK
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WARTIME work at the Watertown Arsenal on the production of centrifugal castings demonstrated the validity of a new approach to the problem of producing sound, high quality castings by this method. It seems also to illuminate several misconceptions on the flow of molten steel through nozzles.

In the production of centrifugal steel castings of considerable length, taper and wall thickness, the problem of introducing molten metal to the spinning mold at the proper rate was very important. Too rapid a rate led to hot tears and low physicals; too slow, to cold shuts.

The proper rate of flow appeared to vary considerably throughout the pour. It was theorized that the amount of metal to be injected into the mold at any instant should change according to a curve expressing the amount of metal which would solidify in the same instant, after first establishing a molten layer which would exist throughout the pour.

Field's[1] and Nelson's[2] formulas of solidification were found suitable in these determinations. Curve A in Fig. 1 is the type obtained from plotting the amount of metal solidifying per second against the percentage of the casting poured.

The problem then resolved itself around the method or means of controlling the flow of molten steel through a nozzle at the predetermined yet variable rates.

This was successfully accomplished by the application of hydraulics; specifically, the principles of the flow of liquids through an orifice formulated as: $V = c\sqrt{2gh}$ and $Q = ac\sqrt{2gh} = aV$. Here, V is velocity in ft per sec, g is the gravity constant, c is a constant, h is the head or height of fluid above discharge point in feet, Q is volume in cu ft per sec, and a is the area of the orifice in sq ft.

A pouring-box as shown in Fig. 2 supplied the head of metal to control the flow velocity. The head of metal in the pouring-box was maintained for an initial period by an incoming metal supply, then gravity feed assumed control and the progressively lowered head provided the desired continually reduced flow of metal into the spinning mold. The change in rate is shown by Curve B in Fig. 1.

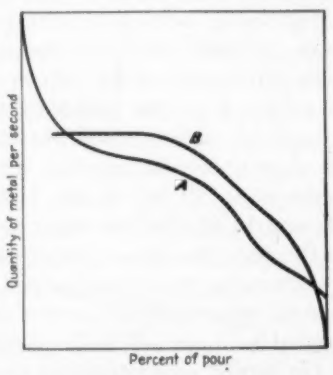

FIG. 1—Curve A shows the typical shape of a solidification curve. Curve B is a plot of a pouring rate deliberately varied to follow approximately the shape of Curve A.

By the above method, 5000 lb of molten steel were poured at a controlled rate through 5/8-in. diam nozzles with improved results. Predictions of pouring rates and total pour times were possible under varied sets of conditions and it was

The investigations reported in this article were made while the author was on active duty with the U. S. Army, assigned to the Ordnance Dept. as Production Metallurgist at the Watertown Arsenal, Watertown, Mass. The opinions expressed are those of the author, and do not necessarily represent those of the Army Ordnance Dept.

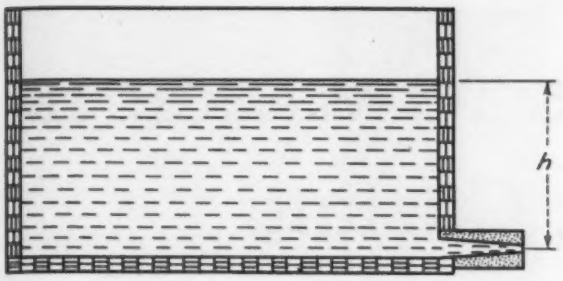

FIG. 2—The shape of the pouring-box used in the controlled pouring rate experiments.

shown that the hydraulics formulas $V = c\sqrt{2gh}$ and $Q = aV$ are applicable to the flow of molten steel through nozzles. The value of *c* must be determined experimentally, as it varies with fluidity, temperatures and nozzle conditions.

It should be pointed out that the design or shape of the pouring-box in relation to its volume will regulate the head, and consequently the flow at any instant or stage of the pouring process. For illustration, several possible pouring-box cross-sections are shown in Fig. 3; all with identical volumes. Obviously, not only the initial head will vary among these shapes, but also the rate of change in head with discharge will differ.

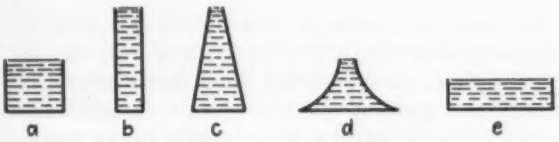

FIG. 3—Varied pouring-box shapes, each of which will have a different initial head, and different rate-of-flow curve.

It is also readily apparent that additional control is gained by regulation of the third dimension in pouring-box design. This type of control was implied though not clarified by Debenham[3] in a recent article. Similar thinking can be applied to the botton-pour ladle used in steel mill and foundry.

Literature is Sparse

Hydraulically, it is true that the same flow is obtained from the bottom or side of a vessel if the hydrostatic head is the same. So, it would seem that free flow of molten steel from the nozzle in the bottom of a ladle would also be according to $V = c\sqrt{2gh}$. Little on this subject is shown in literature and the latest reference[4] shows a somewhat popular belief that the velocity of molten steel from a nozzle varies with the *square* of the ferrostatic pressure or ferrostatic head. But from $V = c\sqrt{2gh}$ it can be seen that the velocity from the ladle varies as the *square root* of the ferrostatic head; or, as the ferrostatic pressure, which varies directly as the head. This agrees with the work of Hite and Callinan[5] as has just been brought to the attention of the writer by both Debenham and Soler.

From the nozzle to the bottom of the mold or to the stool, the metal acts as a free falling body. The velocity relationship is shown by the formula: $V = \sqrt{2gs}$. Consequently, the velocity at which the molten metal strikes the mold bottom or stool is a summation of two velocities. If then, for example, the value of *c* in $V = c\sqrt{2gh}$ equals 1.0, the final velocity will vary directly as the square root of the total distance from the surface level of molten metal in the ladle to the stool. (See *H* in Fig. 4.) Then, $V \sim \sqrt{H}$.

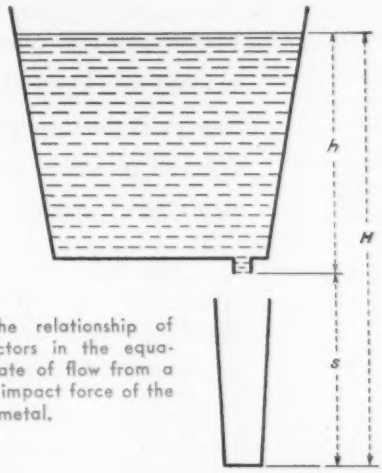

FIG. 4—The relationship of various factors in the equations for rate of flow from a nozzle and impact force of the stream of metal.

Continuing, according to mechanics of energy, $F = \frac{1}{2}MV^2$ where *F* is impact energy, *M* is mass and *V* is velocity. It is evident from this formula that *F* varies directly as *V*' Since *V* varies as the square root of *H*, *F* varies directly as $(\sqrt{H})^2$ or H. Formulated, $F \sim H$.

Therefore, if a ladle were increased 1/3 in height, the impact energy of the stream on the stool would be increased only by the amount that the increase in ladle height is proportionate to the total height. This appears more reasonable than the concept recently expressed[4] or misquoted which asserts that the impact value increased 250 pct with a 1/3 increase in ladle height.

It is believed that wider recognition and application of these hydraulic principles to the pouring of molten metal would improve control in rate of flow and consequent rate of mold fill. This was found true in the work at Watertown Arsenal.

The same should be the case in the production of ingots or sand castings for the principles are applicable if the nozzle (eroding or non-eroding type) is in a bottom-pour ladle, teeming pot or tundish, and if the orifice is a downgate or runner-gate in a sand mold.

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[2] L. H. Nelson, "Solidification of Steel in Ingot Molds," Trans. ASM, 1934, vol. 22, p. 201.
[3] W. S. Debenham, "Ladles," Proc. Electric Furnace Steel Conference, AIME, 1945, vol. 3, p. 45.
[4] W. J. Reagan, "Reducing Ferrostatic Head," Proc. Electric Furnace Steel Conference, AIME, 1945, vol. 3, p. 41.
[5] E. C. Hite and E. E. Callinan, "Study of the Factors Influencing Pouring Rates of Nozzles," Bul. ACS, March 1939, p. 80.

CRITICAL FACTORS TO WATCH IN Investment Casting

Many variables affect investment casting accuracy. Among these are melting and preparation of alloys, casting processes, removal of castings from the investment, cleaning, straightening, finishing and inspection, all of which are discussed in this second part of a two-part article. Part I appeared in the July 6 issue.

By R. L. WOOD, President, Arwood Precision Casting Corp., Brooklyn, and D. VON LUDWIG, Director of Research, Vacuum Casting Corp., Philadelphia

THE degree of accuracy attainable in an investment casting is determined by the interrelationship of a number of major variables. Some of these have been recognized and the means for offsetting them have been developed. The practical precision inherent in any of the commercial investment processes can be predicted and controlled.

The normal probable dimensional variation imparted to the cavities produced in the hot investment mold is between 0.001 and 0.002 in., if suitable control has been exercised over the operations involved. The greatest size and shape variations usually occur in those operations which involve the preparation of the metal, filling the mold and finishing the castings. Although most or all of the variables are recognized and can be predictably anticipated for many parts in most alloys, many factors are beyond the immediate range of economical process control. These are essentially the inherent technical details, common to all of the investment techniques, which result in the normal trade limits of precision being fairly constant.

For nonferrous castings based on aluminum, magnesium or copper alloys, the commercially practical limit for most castings is ± 0.002 in. per in. or fraction thereof. For all high temperature non-ferrous or refractory alloys and for all ferrous materials the present tolerance is ± 0.005 in. per in. or fraction thereof.

Where the economics of the application justify other than what constitutes normal practice, according to the present trade concepts of usual techniques, somewhat closer tolerances may be held. This is also true where careful alloy selection has been made to obtain the best possible foundry characteristics for a metal suitable for the application intended. Such castings are expensive, compared to the present normal per-piece price for parts which are held to the normal tolerance ranges.

Equipment used and the techniques employed in melting metals for investment casting have pronounced effects on the precision of the castings produced, both with respect to dimensional accuracy as well as metallurgical uniformity. The most obvious considerations involve minimizing contamination of the melt with gasses, drosses, oxides, nitrides or slags. In addition, the change of alloy constitution through volatilization of constituents or through oxidation loss or slagging must be held within considerably closer limits than those acceptable to normal foundry and mill practices.

Analysis Affects Tolerances

Considerable latitude may be permitted in the alloy specified for use in any investment cast part. Where the tolerances of the part are to be closely controlled, however, it is usually imperative to maintain a narrow composition range within the stated specification, and control within that range, when possible. In sand foundries or commercial mills, fluctuations in chemical composition are usually disregarded, as long as the product complies with the stated composition and physical properties.

Alloys of aluminum, magnesium or copper are normally melted in gas or oil-fired crucible furnaces. These should be designed to prohibit contact between the metal and the combustion gases.

POURING manganese bronze from a 60-lb induction heated crucible furnace.

For alloys which evolve toxic or troublesome fumes as well as those subject to rapid oxidation, protective hoods must be employed. Induction electric crucible furnaces are commonly used for melting high temperature copper base alloys, manganese bronze, silicon brass and beryllium copper.

Furnaces of the latter type are being built to handle masses up to 800 lb. While small when compared with equipment used for the gross metallurgical industries, the small metal charges are necessary at present for investment practices to permit proper integration with the balance of the production cycle. Induction crucibles seem to impart the best known metallurgical properties to small melts of metal suited for investment founding.

Prepare Melt Carefully

Various forms of carbon arc furnaces have been extensively used to produce refractory and ferrous alloy castings. Limitations, chiefly in the size of melt which can be handled by arc furnaces designed for the trade, as well as in the degree of metallurgical control which can be secured, are causing the increased substitution of induction or resistance heated crucibles for the arc furnace. For special work the inversion carbon arc furnace will undoubtedly be used for some time to come.

Unless great care is employed in preparing a melt, pronounced dimensional variation will be encountered in the castings. Many alloys are less susceptible to shrinkage when they have been incompletely degased. This is attributed to the tendency of small gas bubbles to be precipitated during the transition from liquid to solid, partially or wholly offsetting solidification contraction. As the calculation of pattern size has included provision for contraction of properly processed, gas free metal, castings produced from gassy metal will be oversize as well as metallurgically inadequate. Fluctuation in degasing treatment will be reflected in fluctuation of casting size.

Lead a Possible Detriment

Many alloys contain volatile elements, such as zinc, which are easily lost during melting. Such alloys are difficult to control. Nominal alloy ranges for these types of alloys are broad because the difficulty of adhering to precise proportions is recognized. The solidification characteristics of such alloys are measurably different between the ranges of acceptable chemical composition. In the investment foundry, the difference between composition on the high side and the low may mean the difference between castings acceptable or rejectable on dimensional standards, the deviation being often as much as 0.002 in. per in.

There are alloys containing elements which produce inferior investment castings because the metal is sluggish, drossy or excessively active on contact with the hot investment. All alloys of copper or aluminum containing lead are undesirable from the foundry standpoint. Rarely, in a properly designed investment casting, is the use of such an alloy justified. The main reason for the presence of lead is for improved machinability, except in those instances where bearing properties are requisite.

Alloy Steel Easily Handled

In a properly designed and produced investment casting the amount of secondary or finish machining should be so slight that machinability should be an inconsequential factor in selecting the alloy for use. The reduction in finishing cost resulting from the presence of lead in the alloy is far offset by the increased per-piece cost due to high foundry scrap. An exception to this rule is encountered with red brass, or 85-5-5-5, which is not too troublesome to handle.

Foundry characteristics of all straight carbon steels are decidedly inferior to those that apply to equivalent grades of low alloy steel. The slightly higher raw metal cost for the alloy is well offset by the increased yield of good castings and the improved detail and finish of the parts produced. This results in castings that cost less per piece than those made of straight carbon steel.

Similarly, low carbon straight chromium steels such as type 416 are comparatively difficult to cast, when contrasted with the 18-8 chrome-nickel alloys. This is attributed in part to the activity of the high free chromium and nickel alloys in contact with the hot investment mold. These materials tend to pit on the surface due to the

formation of chromium oxide. Any tendency of an alloy to react with the mold or the atmosphere and form slags or oxides which resolve into pits in the surface or inclusions in the structure of a casting greatly limits its usefulness for investment founding.

Of the hundreds of alloys being investment cast, a few are particularly suited to the process, producing the highest attainable accuracy coupled with the most reliable physical, chemical and mechanical properties. In many instances, the alloys which have been the most desirable for other foundry applications are most effectively handled in investments.

Both Dowmetal "C," of the magnesium family, and Alcoa "356" of the aluminum family, are most widely favored for foundry purposes. In the investment technique they are often the only alloys which will permit production of the most precise and detailed casting designs.

In the copper family, silicon brass and beryllium copper are the most satisfactory for investment forming. Less castable, but possessing desirable characteristics for specific applications are manganese bronze, phosphor bronze and red brass. Alloys which should be avoided are all brasses containing lead, aluminum alloys containing copper and zinc, and the highly active magnesium alloys.

Stainless is More Fluid

The most satisfactory ferrous alloy for the investment foundry is the austenitic stainless, 18-8 type. It is most fluid, least subject to change in composition during melting, least subject to gasing and entirely passive in contact with investments. For general commercial use in parts not requiring the properties of stainless metals, either the 3100 or 4100 series should be specified, particularly to replace parts formerly made in straight carbon steel by other technologies. There are, in fact, few applications where the straight carbon steels are justifiably investment formed. Their poor fluidity, high chemical activity and gasiness result in the production of comparatively unstable and inaccurate castings.

In the application of the refractory, high temperature alloys, foundry characteristics are usually of minor consequence. Special properties of these compositions, used to fulfill a particular application which might not be otherwise possible, make their use mandatory, regardless of the difficulty which might be encountered in casting.

Four different investment casting techniques are now in use. Nearly every foundry uses two or more of these processes to handle different types of castings and alloys. Since the overall technology of the various foundries differs, it is impossible to make a positive comparative evaluation of the several techniques without risking unfair criticism of any one process. Where a foundry uses several casting techniques, it is undeniable that, under a particular set of controls, one process will usually produce more accurate castings than another. For example, centrifugally cast clusters of small parts usually are more uniform in size than the same clusters cast in vertical suction or static casting devices. However, metallurgical properties of the suction or static cast parts usually are more reliable than those obtained by centrifuging.

LOADING flasks into a large centrifugal casting machine. Gas flame burning into the center metal distribution basin is for heating it sufficiently to avoid chilling the metal.

The four casting processes are: (1) Pressure casting, usually by means of an inversion arc melting furnace to which individual molds are clamped for filling by inverting the furnace and mold, pressure being applied after the metal has drained into the mold cavities by compressed air ranging from 15 to 30 psi; (2) centrifuging, in which molten metal is fed to investment molds by the pressure developed from radial acceleration of molten metal poured into the central spinner basin, which has a limited tendency to segregate impurities of lesser specific gravity than the metal; (3) vacuum or suction casting, a system whereby air is withdrawn upwardly or downwardly through the mold investment in advance of the metal being poured or drawn up into the mold by displacement pressure; and (4) static casting, which involves no special equipment, since the hot investment molds are poured and filled in precisely the same manner employed in other foundry techniques.

The variation in size of investment castings is

attributed to variables which occur after the mold has been made and heated to the proper temperature to receive the metal. Many of the variations are due to fluctuations in metal composition. The actual temperature of the metal as it enters the mold cavity, combined with the internal temperature changes which occur when the metal contacts the investment, cannot be readily controlled in commercial practice to such a degree that size variations of the castings can be totally avoided.

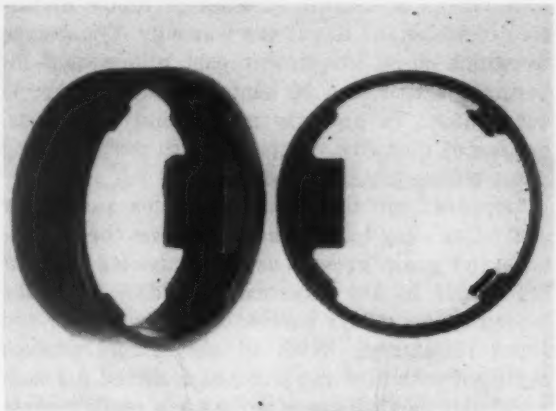
Where the desired pouring temperature of a steel casting may be 3150°F into a mold at 1800°F, equipment used to measure metal temperature is rarely capable of accuracy closer than ± 25°F. Even though the molds may be removed from furnaces which are controlled to within 10°F of the desired heat, relatively slight variations in time required to fill the molds after removal from heat will be enough to cause measurable variation in size of the castings produced.

Drop in mold or metal temperature of 100° to 200°F can cause differences of more than 0.0005 in. per in. which can amount, on a large part, to final size differences in excess of 0.002 in. The more sluggish the alloy is, as a rule, the more critical the pouring temperature. For this reason, importance of alloys possessing good fluidity and stability cannot be overemphasized if close control of dimensions is required.

The final operations in producing investment castings have an important control of the uniformity of the product. Once the metal has solidified, all subsequent processes can only remove excess or rearrange the metal. Additions

POURING a 20-lb melt of stainless steel into a centrifuge from a hand-held portable induction heated crucible.

Correction: In Part 1 of this article published in THE IRON AGE, *July 6th issue p. 91, the frozen mercury pattern process mentioned is not in the laboratory stage. Two Cleveland, Ohio, companies, National Bronze & Aluminum Foundry Co. as well as Thompson Products Co. are using the "Mercast" process for quantity production. An article on this process was carried in* THE IRON AGE, *March 17, 1949, p. 94. Ed.*



CASTING of silicon brass, held to size and roundness within 0.005 in. on a 1.225 in. diam.

cannot be made. The finish operations begin with the removal of the castings from the flask. This must be carefully done to minimize distortion or breakage. Most ferrous and refractory alloy parts must be dipped in a molten caustic to free them from investment in cored sections.

Castings then are separated from the cluster by removal of sprues, runners and gates. Band saws, friction saws, abrasive cutoff wheels and disks are used. Cutting of pieces adjacent to others must be avoided, so the layout of all clusters must be done with the need for providing straight line access to the cutting machines observed.

Rough castings are ground on wheels or surface belts to remove gross metal surpluses at gates, vents, risers or major flash lines resulting from investment failure. A preliminary inspection is made to remove all obvious scrap parts resulting from misruns, investment chips, holes in the castings, etc. The remainder are finished by machine or hand filing, polishing, drilling, reaming, straightening and, when specified, sand blasting.

The surface finish of the areas in contact with a good investment are as smooth as the surfaces commonly encountered in diecastings or pressed metal powder parts. The final surface finish is determined by the use of sand blasting to provide a uniform matte finish to all surfaces of the piece.

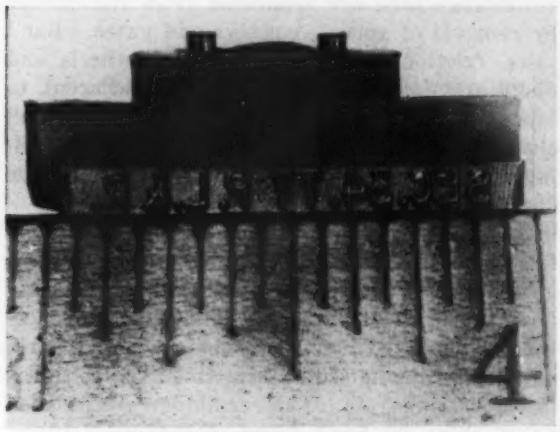
Finish operations usually include removal of all small metal droplets, attributable to air holes in the investment, fins and small flow lines. If the service of the part is not affected, and the appearance is not important, these minor superficial defects should be left; the castings will cost less. Where gated surfaces are to be finished

by machining, the cost is reduced if the rough cutoff gate is allowed to remain without attempting to grind the surplus to the casting line.

Special finish operations may include press straightening or stretching of castings to eliminate effects of casting stresses or minor distortion in shape due to pattern warpage. The degree to which most investment cast alloys, not inherently brittle, can be bent without fracture is surprising. In properly melted and cast parts, no loss of ductility, compared with parts cast by other techniques, is encountered.

Improved metallurgical techniques and closer control of alloy balance has overcome the brittleness and grain growth usually expected in castings made in hot investment molds. Even the leaded copper alloys possess high elongation and shock resistance. With all alloys, foot presses equipped with dies and punches designed for each particular casting are often used to realign parts with uniform geometrical shapes. Circular parts can be brought and held to within 0.001 in. of size and roundness.

Small cored holes usually are finished by passing an undersized drill or reamer through or into them. This is not necessary when preformed precision ceramic insert cores have been used to produce the holes. By means of precision



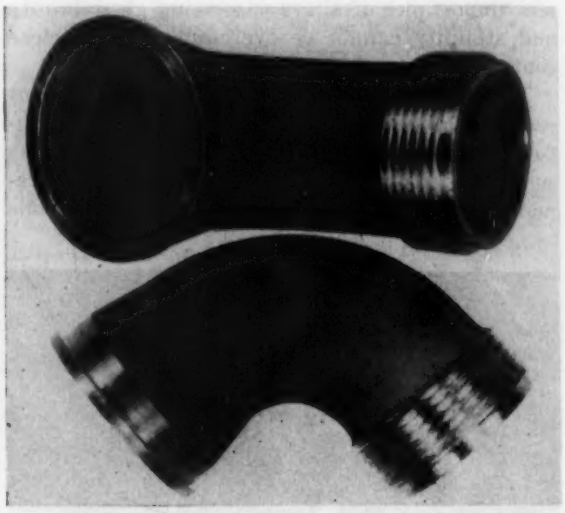
THE RAISED NUMBERS on this meter number casting are cast 0.125 in. high and used without finishing. By inserting different letters and numbers in the die, the same mold is used to produce short runs of a large number of different stamps.

ground hollow cores, relatively long, straight, thin holes may now be produced in almost every alloy with no practical limit to the length v. diameter ratio. This technique can only be economically employed on parts involving extensive production runs. In special cases involving unmachinable alloys, this technique may be justified regardless of the number of parts needed; no other way of forming a small, accurate hole may exist.

Many precision machining operations are performed by the investment foundry, when suitably equipped. Finish threading, drilling, facing, grinding or tapping can be performed economically during the foundry casting finish operations, thereby providing completely finished castings complete in all details, at a substantially lower cost than would be involved by having the parts finished by the customer.

The economics of having the foundry do the finishing are favored by the fact that the foundry must be equipped with jigs and fixtures to check the patterns and final castings. These can often be employed without change to hold the parts for precision finishing. It is but slightly more difficult to drill a hole to precise final size, assuming an alloy which is machinable, when using a correct casting jig, than it is to rough drill it merely to remove surface roughness.

Considerable reduction in casting price can be affected by cooperation between the designers and inspectors of the customer and the foundry in establishing standards for visual inspection. If the appearance is secondary in the part, all functionally sound parts should be used, regardless of minor surface irregularities. This is not the case when acceptance standards have been



BOTH ENDS of a finished silicon bronze elbow, ready for use, have been faced to within 0.001 in. of size, on approx 1-in. diam. Threads were not cast, but chased with a die in a lathe.

predicated upon the prior appearance of the part produced by machining solid stock or sand castings or forgings. The surface of the investment casting will be as smooth as the grain size of the grit used to sandblast it, as well as the air pressure employed and time of blasting.

Requiring the indiscriminate blasting of investment castings merely to produce a pleasing superficial matte finish is detrimental to fine detail, letters or sharp corners, and should be avoided. The surface roughness of the cast and blasted part will never be less than 0.00025 in. The limits of the absolute cast tolerance are modified in that order or more when all other variables have been adequately controlled.

New Materials And Techniques Covered at AES Convention

THE 37th Annual Convention of the American Electroplaters Society and 4th International Electrodeposition Conference, held recently in Boston, provided a good bird's-eye view of the progress of the electroplating industry throughout the world, as well as in the U. S.

In addition, an extensive exhibit of plated products was shown, set up and contributed by various branches of the Society, illustrating the type of work being done by electroplaters throughout the country. A variety of papers covering technological advances in the industry were presented at the Educational Session.

One paper, presented by J. E. Stareck, H. Mahlstedt and F. Passal, discussed the operating characteristics of a self-regulating high speed chromium plating solution, comparing it with the conventional chromic acid-sulfate solution. The new bath (THE IRON AGE, Feb. 16, p. 91) was shown to possess a number of advantages, among which are higher cathode current efficiency, increased plating speeds through use of higher current densities, greatly reduced staining, ability to plate bright after current interruptions, and much better covering power.

Adhesion Is Atomic

A. Brenner and Virginia Morgan presented a new method of measuring the adhesion of electrodeposited coatings. One of the important aspects of electroplating is the adhesion of the deposit. A poor deposit will flake, peel, or blister. The adhesive forces are essentially atomic in character and if the adhesion of a plate is high, rupture may take place elsewhere than at the interface, showing that the adhesion of the deposit is greater than the inherent strength of the basis metal itself.

The new method involves electroforming a mushroom-shaped projection, or nodule, of cobalt which serves as a grip for detaching the coating. The nodule is detached by means of a chuck and a strong spring. The force of detachment is measured in pounds per square inch. The electroformed nodule, about 1/16 in. in diam and about 1/32 in. high, is formed in about 3 to 4 hr, and the complete test can be made in one day.

Clean Odorless Baths

A report was presented by K. L. Koessler and R. R. Sloan on the applicability of a nickel fluoborate solution, containing about 7.5 oz per gal free boric acid, to the plating of stereotypes. A 700-gal tank was run in production for 60 days. At the end of this time a complete change to fluoborate was made because of the ease of control, high plating speed (0.005 in. in 7.5 min), economy of heating, anode and cathode efficiencies, stability of pH, cleanliness and absence of odor in operation, low power and chemical cost and ease of control of pitting.

A typical cycle of operating the nickel fluoborate bath is: (1) Alkaline cleaning; (2) rinse; (3) acid dip in 10 pct fluoborate acid at room temperature; (4) rinse; and (5) nickel plate in the fluoborate solution at pH of 3 with anodes of rolled depolarized nickel.

The solution is made up by simple dilution of the concentrate, dummying and then filtering. For the first few days a little hydrogen peroxide may be used to prevent pitting, but this may be dispensed with. Current densities employed are 70 amp per sq ft at 94°F and 7 v; or 90 amp per sq ft at 106°F and 8.1 v. Anode efficiency is almost 100 pct.

The deposit is a matte finish in appearance with some lustre, somewhat below semi-bright plate. Experiments have shown that the solution gives some response to brighteners, but no extensive

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Electroplaters' convention featured papers covering all aspects of current technology in the field. An exhibit of plated products was shown, and discussions included AES research projects.

work has been done in attempting to produce a bright plate. There is no sludging and no slurry in making up the bath. Savings in operation have been estimated at about 75 pct in labor, which was formerly used in making solution additions, purifying and filtering; 60 pct in the cost of electric heating, which was formerly used and eliminated by operating at a low temperature; and 50 pct in the reduced mechanical costs.

"Measurement of Surface Smoothness," by H. L. Kellner, described measuring techniques, including (1) microscopic methods for surface examination by perpendicular viewing with oblique lighting parallel to and perpendicular to surface, and for examination of cut edges mounted in plastic, ground, polished, and etched by usual metallographic procedure, either perpendicularly or at an angle to the surface; (2) tracer methods by the Brush Analyzer and the Profilometer, and comparison of results obtained; and (3) the replica method, both by comparison of replicas with Fax Film equipment and evaluation of replicas by Herschman apparatus.

Replica Method Better

One important factor in profile measurements is that the diamond point used tends to flatten out soft metals and give erroneous readings. The replica method consists of obtaining a plastic reproduction of the surface which can be visually inspected and, since it is free from the glare which accompanies a polished metal part, can be judged more accurately.

The Zeiss interference microscope, which combines into one instrument the microscope and the interferometer, was discussed by A. G. Strang and F. Ogburn. With this instrument, the height and depth of surface imperfections, such as fine scratches or microscopic nodules and pits, can be measured over a range of 2 to 80 microinches. The surface can be inspected with a magnification of 664X and can be scanned as with a microscope. Photographic records can be made of small areas about 0.009 in. in diam. No special preparation of the surface being examined is required. This tool has not yet been fully evaluated, but has important possibilities in the measurement of metal surfaces.

Microroughness Covered

Data were supplied by C. L. Faust on microroughness as revealed by Profilometer, Brush Surface Analyzer, and reflectivity measurements, as well as microscopic examination, before and after electropolishing and chemical polishing of steel, brass, aluminum base metals and nickel plate. The effects of chemical and electrolytic polishing in leveling or smoothing metal surfaces were also discussed, pointing out that even microroughness could be judged by eye, by its reflectivity, and that microroughness could be judged by eye, directly. The results of polishing or leveling the surface by mechanical, chemical and electrolytic means were compared, showing that non-mechanical methods often produce better reflectivity and remove microscopic debris and nonmetallic particles left by mechanical polishing.

Mechanical, chemical, and electrochemical methods of leveling were reviewed by G. W. Jernstedt. The fundamental factors affecting leveling with periodic reverse current plating, such as the PR cycle, current density, thickness of deposit, agitation, solution composition, addition agents and contamination, were described. Special consideration was given to the elimination of buffing in the appliance and automotive fields by polishing the base metal in the flat and by providing increased leveling in the plating bath. The effect of leveling with the PR process on orange peel resulting from drawing opera-

BARREL PLATING installation with 14x36 in. Bakelite cylinders and Monel cylinder equipment for cleaning. Photo courtesy of Hanson-Van Winkle-Munning Co.

tions was noted. Leveling is advantageous with heavy deposits.

PR plating and its effects upon the leveling of deposits in the plates were summarized as follows: (1) The more sacrificial the cycle, that is, the longer reverse or deplating periods, the better the leveling action; (2) the higher the current density, the better the leveling effect, as for example, the optimum in a copper cyanide solution is from 50 to 75 amp per sq ft at 150°F; (3) the heavier the deposit, the greater the leveling effect, although the rate of improvement decreases after a certain point, the optimum being between 0.001 and 0.002 in.; (4) agitation by air is recommended, rather than by mechanical means, and greatly improves leveling; and (5) there is nothing critical regarding solution composition except to keep the solution at its maximum efficiency.

Impurities are Harmful

Organic and metallic impurities have a deleterious effect on leveling and should be removed. Applications of PR plating shown included automobile bumpers, record stampers, etc., illustrating the elimination of nodules in heavy plates and the more uniform crystal structure obtained.

"Surface Contour and Leveling," by A. H. DuRose, W. P. Karash and K. S. Willson, treated leveling with consideration of mathematical approaches, including atomic-force characteristics. The relationship between thickness of the deposit and leveling for various solutions was discussed and results were given to demonstrate methods for evaluating the relative contribution of "flowing" and "cutting off" metal in buffing.

It was concluded that all electroplates produced some leveling effect, and pointed out that some aberrations might be found which could be caused by excessive roughness of the deposits in a nickel solution (for example, if the thickness were excessive or if the solution were improperly operated) rather than by absence of leveling effect. With acid copper, zinc and tin deposits, the throwing power into small recesses was often greater than over larger open areas. To some extent, this microthrowing power would depend upon the placing of the anode.

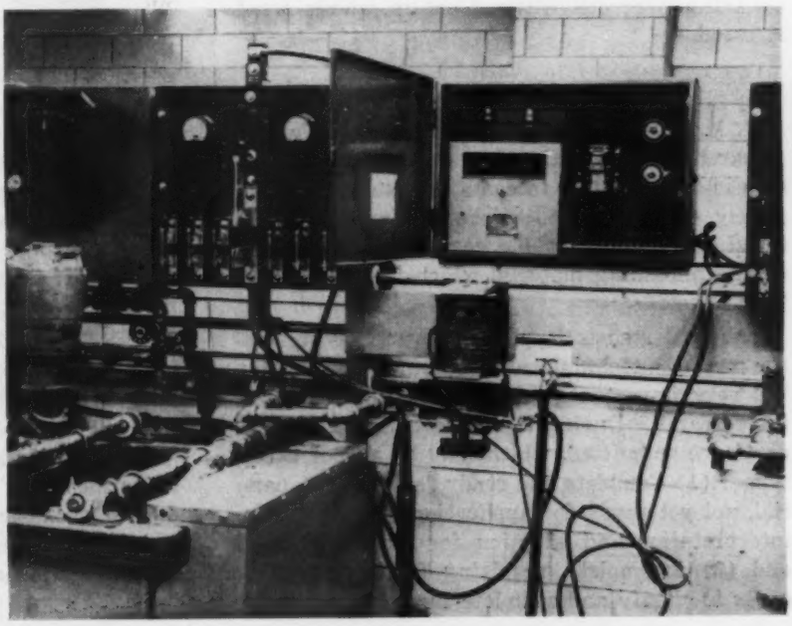
Some results were quoted on an investigation into buffing three types of nickel deposits—gray, high chloride gray, and semi-bright. It was found that semi-bright was easiest to buff. In a comparison of buffing of copper, nickel and tin, it was found that nickel was buffed by a cutting or dragging-off action of the buff; copper and tin by plastic flow. An important element in buffing is the use of the proper polishing powder or medium, which must have a higher melting point than the metal being buffed.

M. B. Diggin covered results of electropolishing in various solutions. In 10 and 20 pct sulphuric acid solutions, no leveling effect took place. In a sulphuric-phosphoric-water solution, there was calculable leveling. In a solution of 66 pct sulphuric acid, there was a slight leveling or polishing effect.

Metal finishing by abrasive tumbling was the subject of a paper by H. M. Goldman. Information was presented on tumbling techniques involving the use of abrasives where actual cutting down of metallic surfaces is desired. Production and experimental operations were described.

Among the details covered were the purposes of the medium; to form the abrasive component or carrier, and the separation of the parts to prevent them from marring each other during the tumbling operation. The ratio of work to medium was generally calculated by volume, ranging from 1 work to 2 medium up to 1:10 The total load should take up 60 to 70 pct of the barrel space.

The softer the action required in tumbling, the larger the load, whereas the harder and more severe cutting action would take place at barrel



PR CONTROLLER for Wes-X bright copper plating installation. Photo courtesy of Hanson-Van Winkle-Munning Co.

loads under 60 pct of capacity. This is because the longer slides give the most cutting action, and the length of slide is greatest at the diameter of the barrel.

Speed of rotation is very important, low speeds giving slow action. High speeds give rapid action, but risk marring of the work. The speed of rotation chosen depends upon a number of elements in operations: Size, shape, and type of the metal part; the type and size of the media; the temper of the barrel; and the finish required. The speed range is governed by the size of the barrel, the optimum peripheral speed being from 100 to 200 fpm with the limit of rotational speed at 70 rpm.

Barrels are cylindrical or polygonal. The action of the cylinder is the smoothest, but of the polygon the more rapid. The most common barrels in use are from 30 to 36 in. in diam and octagonal in shape. The barrels may be unlined for rough work, or they may be lined with hard maple blocks, rubber, or synthetic materials.

The chemicals used in tumbling have several functions: Cleaning the work; cushioning to prevent the work from marring; and protection against rust in later storage. It is difficult to generalize on the various times necessary for different operations because the range is so wide, depending upon the type of work and the finish required. For example: De-burring may take from 15 min to 12 hr; grinding, from 8 to 48 hr; and polishing, from 15 min to 16 hr. Applications for barrel finishing or tumbling were cited.

Factors in the choice of abrasive belt polishing equipment, heads and belts were discussed by E. E. Oathout. Case histories were presented, giving details of the procedure used and the advantage gained in lower cost and higher rates of production. The advantages of abrasive belt polishing over conventional set-up wheels were stressed.

Research Carefully Planned

G. M. Cole described the work of reporting on research projects initiated by the AES. The first step in a research is to comb the literature completely, eliminate duplications and irrelevant material and then to make a correlated abstract of all the remaining material which is pertinent to the project.

The next step is to plan the work, laying out the methods, technique and equipment and, lastly but very important, the limiting conditions for the research. During the research, progress reports are submitted, which may be any of three types: (1) Complete and ready for use; (2) partial, not yet ready for application but subject to interpretation and adoption for individual use; and (3) incomplete, requiring further work in order to clarify and complete the job.

It is important to understand that none of the AES research projects is intended to solve specific problems of the individual plant; any such solution would be purely fortuitous. Their purpose is simply to place in the prospective users' hands a description of the means and the necessary information to enable them to solve their own specific problems.

W. A. Wesley presented a very clear and lucid explanation of the aims and purposes of research of all kinds, as well as the present program of the AES, in a paper entitled "Why Pay for Porosity Research?"

It is estimated that there are at this time about 123 laboratories in the United States doing some research of one kind or another on electrodeposition. Why, then, is it necessary for the AES to undertake additional research, when there are so many others already in the field? It is because the other laboratories are not engaging in the type of work which the projects of the AES intend to cover.

AES Research is Broad

There are three types of research work in general: (1) Fundamental—basic or scientific; (2) applied, industrial or what may be called technical; and (3) control, testing and evaluation, including improvement or development of special processes.

Only about ten out of the 123 laboratories are engaged in the first class of research, namely, scientific work. The balance are active in technical work or improvement in processes or methods. The AES has planned its projects on broad scientific lines for general application, purposely avoiding any attempt to settle individual problems; these can be better left to the industrial laboratories.

Dr. Wesley cited as an example the present research on porosity in deposits, the causes of which are still unknown and which, consequently, needs continued fundamental research to develop new approaches and new forms of attack. However, considerable progress has been made to date, including the following: (1) A knowledge of the permeability of nickel; (2) a knowledge of the effect of thickness of deposit on permeability, in which it was found that thickness of deposit definitely reduces the permeability of the electroplated coating; (3) a comparison of the permeability of electrodeposited and wrought solid metals; (4) permeability changes on exposure to corrosion; (5) permeability v. weight losses and the time involved in the perforation of foils; (6) hydrogen in nickel deposits v. thickness of layer; and (7) porosity v. permeability.

Loss in weight under corrosion does not parallel permeability in causing porosity. Porosity is due to permeability and not merely to loss in weight. Progress to date has been so significant that a new project is being set up to expand the work.

Argentine Steel Plant

NEARS 100,000-TON CAPACITY

By A. W. GREGG
Consulting Engineer,
Whiting Corp.,
Harvey, Ill.

Argentine's steel producer, ACINDAR, has increased its yearly tonnage from 3500 metric tons 7 years ago to a proposed 100,000 tons in 1950. Local labor was recruited and trained while steelmaking facilities were planned, built, and expanded. American firms supplied technical advice and personnel.

IN ARGENTINA, more buildings and structures are supported by reinforced concrete than structural steel. This building preference has resulted in a tremendous demand for steel reinforcing bars. The principal producer of this product is the Industria Argentina de Aceros, located at Rosario, S.A. This 7-year-old company is familiarly known by the name "Acindar," a contraction of parts of the words meaning "Steel Industry of Argentina." Its tonnage record of steel shipped since the start of operations is shown in the accompanying table.

With the exception of a few engineers and supervisors, the 700 men on the payroll at Rosario were recruited locally. Most are young men from the farms. They are largely of Spanish and Italian ancestry. When the plant was started, every man had to be trained for his job. Today there is a capable and highly intelligent staff operating the openhearth and rolling mill.

Two 35-ton (metric) basic openhearth furnaces supply the steel for the rolling mill. Plans for a third furnace are now being prepared. Originally the ingots made by the company were 5x5x35 in. They weighed 245 lb and were bottom poured. The present ingots are 10x10x72 in. These weigh 2000 lb and are top poured. Plans are now being made to pour 12x12x74 in. ingots weighing 3000 lb.

Ingots are rolled on a 23-in., three-high mill to 5, 4, 3, and 2-in. billets. The billets are rolled in a 10-in. mill. As molds are now poured difficulty is encountered in stripping with pouring pit crane. Cars to transport ingot molds, and a stripper, are now being built. These will speed up the operations in the pit.

This is believed to be the last article written by Mr. Gregg before his death on June 8. Publication was delayed for clarification of some of the material from Argentina.—Ed.

Two No. 7 Whiting cupolas were installed in March of this year, adjacent to the openhearth furnaces. The cupolas are equipped with complete mechanical makeup and charging equipment. Cupola hot metal will be used to supply 40 to 50 pct of the charge in the openhearth furnaces. The major portion of the cupola charge will consist of baled steel scrap. The carbon content of the metal as tapped will vary from 2.60 to 2.90 pct. Openhearth furnace output will be increased about 30 pct as compared with operations using an all cold charge.

Because there is no overhead crane on the openhearth charging floor, cupola metal is delivered by a crane on the pit side of the furnace through a door in the back wall. This novel method has worked out satisfactorily.

An ingot mold foundry will shortly be installed in a building, now under construction, adjacent to the openhearth building. This foundry is now being engineered by the Whiting Corp. of Harvey, Ill. Capacity is planned for 16,000 metric tons per year. Of this, 1600 metric tons will be ingot molds. The heaviest ingot mold will weigh 2 metric tons. Miscellaneous gray castings will

also be made in this foundry.

A new steel foundry for maintenance operations at Rosario and the new plant at Villa Constitucion will be installed in the near future. The melting department will have 6-ton side-blow converters, operated with a basic lining of local magnesite. Cupolas will supply the molten charge for the converters. Capacity in excess of that required for castings will be used to pour ingots to supplement the openhearth furnace production. Plans for the steel foundry are also being prepared by the Whiting Corp.

Another major project to be undertaken in 1951 will be a malleable fittings foundry. There is a serious shortage of malleable iron pipe fittings in Argentina. When the new rod mill at the Villa Constitucion plant is completed, the mill at Rosario will be scrapped, and the building which it now occupies will be used for the new malleable foundry. Present plans call for a capacity of 200,000 metric tons per year.

The new steel mill at Villa Constitucion, when completed, will be the most modern steel plant in South America. It will be located in a small town about 40 miles from Rosario. The property, originally farm land, consists of 350 hectares (approximately 865 acres) located on the Parana River. Ocean-going vessels will be able to deliver ore and other materials onto the company's dock.

RAW MATERIAL STORAGE: On the raw material side of the openhearth, charges of scrap and limestone are loaded onto charging cars.

Two Corby 40-ton revolving cranes with 90-ft booms have already been installed.

Three major departments of this steel mill are now under construction. Two of the mills, the wire mill and the Morgan mill, will start operating this year. Rolling mill raw material will be steel from Rosario and imported semi-finished steel.

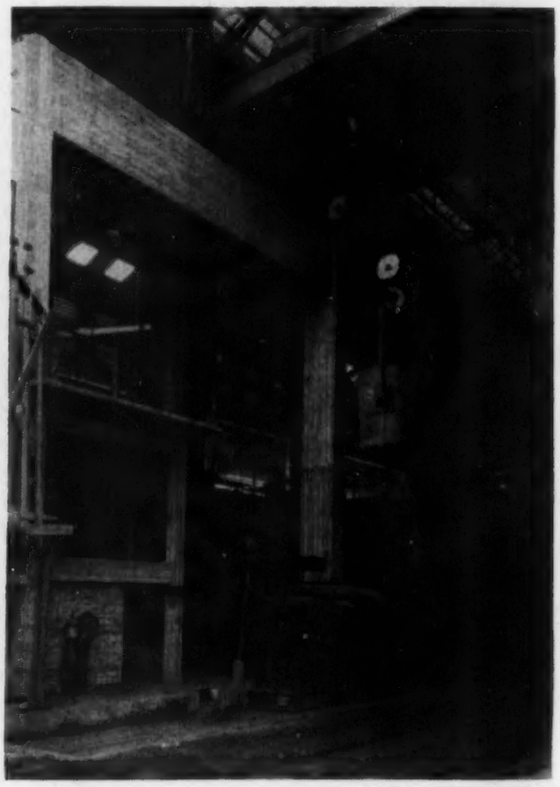
The power plant, a large warehouse, the engineering office building and several small auxiliary buildings have been completed. Also completed

MATERIALS HANDLING: A 15-ton American built overhead crane carries hot metal from cupolas to the openhearths.

is a small hotel on the property affording modern living quarters for 20 engineers.

The wire mill will start operations in August of this year, and will have an annual capacity of 60,000 metric tons. The products will be galvanized wire, nails and barbed wire netting for fencing.

The electric galvanizing plant was built by the Wean Equipment Corp. of Cleveland and the Meaker Construction Co. of Chicago. It has a capacity of 30,000 metric tons per year. The wire drawing machines were made by the Aetna Standard Engineering Co. of Youngstown. Electrical equipment was furnished by Westinghouse and Clark Control Co. of Cleveland.



MODERN CUPOLAS: Cupolas are completely mechanized. They supply the iron for the 40 to 50 pct hot metal charge in the openhearth.

STEEL TONNAGE RECORD

Year	Annual Tonnage (Metric Tons)
1943	3,506
1944	12,963
1945	11,389
1946	15,724
1947	23,603
1948	34,998
1949	55,870
1950	100,000*

*—Estimated.

The Morgan mill will start during the latter part of December of this year. It will have an annual capacity of 250,000 metric tons. It will produce skelp, round bars, wire rods, squares and sections up to 4 in. Electrical equipment was furnished by the International General Electric Co.

In June, 1951, a continuous buttweld pipe mill being built by the Aetna Standard Engineering Co. will be put in operation. The estimated annual capacity of this pipe mill is 120,000 metric tons. Its output will later be increased to 200,000 metric tons by the addition of more stands and a new type flying shear. Pipe will be made varying in size from ⅜ to 4 in. Electrical equipment is being furnished by the Allis-Chalmers Mfg. Co. of Milwaukee and Clark Control Co. of Cleveland.

The power plant, which has been completed, has a 5000-kw turbo steam generator furnished by Westinghouse. The capacity of the power plant will be ultimately doubled.

Plans for future extension of plant now being developed in the engineering department, include a 600,000 metric ton blast furnace, four 150-ton openhearth furnaces, and new blooming and billet mills. A fleet of ore boats will be built to bring ore from the West Coast of South America. They will be unloaded directly onto the company docks.

METAL POURING: Hot iron is poured from the cupola holding ladle into the openhearth transfer ladle.

Since Argentina is seriously in need of developing its steel industry, it is aiding and protecting Acindar by prohibiting the importation of steel into the country. Republic Steel has been acting as a technical adviser to Acindar for several years. Some Republic engineers are working in the Acindar engineering department.

During 1949, the company built homes at both Rosario and Villa Constitucion in the close vicinity of the plants, to be used by employees. Wages of all employees were increased 40 pct during 1949. Also, stock with a value of about a half a million pesos was distributed as a bonus to some 85 key men. The basis for this distribution was length of service and employee efficiency. Dividends paid during the last 2 years have amounted to 35 pct annually.

Machining of Typewriter Castings

CORONA portable typewriters include several gray iron and aluminum castings, and good tooling expedites their machining. One of these cast parts is a gray iron typebar segment. These parts are machined two at a time on a Warner & Swasey turret lathe, shown in Fig 1, with two segments held in an air-operated chuck for these machining sequences. This operation follows facing of the back and drilling of two holes that provide locating surfaces when turning and facing.

Turret tools, having carbide inserts, face two steps, turn the side of the step and cut a chamfer. A rear cross-slide tool then cuts a circumferential slot having parallel faces. At the bottom of this slot, it is necessary to produce a radius to fit a wire of circular section that is thicker than the slot. This wire is bent to fit an arc and becomes the fulcrum point for typebars. To cut the radius for the wire, a

tool made as shown in Fig 2, is used in the front toolpost of the closs-slide.

This tool cannot be fed to depth through the circumferential slot, hence the chuck is stopped and the tool is fed to depth between the two segments, so as to enter the slot from the end of the segment at the precise point necessary for the cut. The chuck is then rotated one or two revolutions at low speed provided by a special two-speed motor for making this cut, which is a light one because the tool is slender and might be broken if a higher speed were used. With this setup, 100 segments an hr are machined.

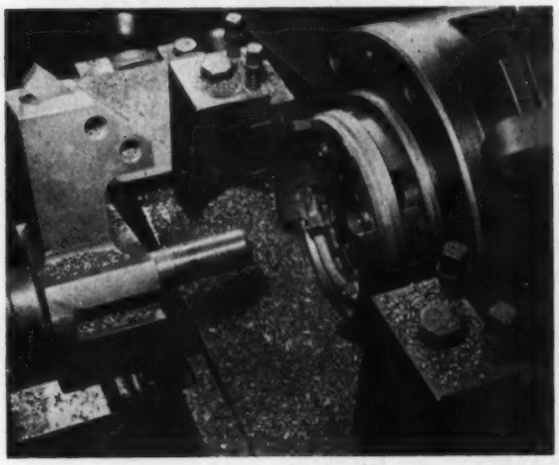


FIG. 1—Setup for machining two cast iron typebar segments in the air operated chuck of a Warner & Swasey turret lathe. A tool on far cross-slide makes an undercut wire groove after a back tool cuts the slot itself.

Segments then are transferred to special purpose milling machines that cut the 42 radial slots one at a time, each piece being indexed automatically by the special fixtures between cuts. The latter are produced by a circular saw or milling cutter that is fed downward in making the cut, the segment being horizontal with the indexing axis vertical. Several machines are used on this slotting because it requires 12 min per piece to cut the 42 slots in each. One man tends several machines, however, because they run through their cycle automatically and stop, needing only to be loaded, unloaded, and re-started by the operator.

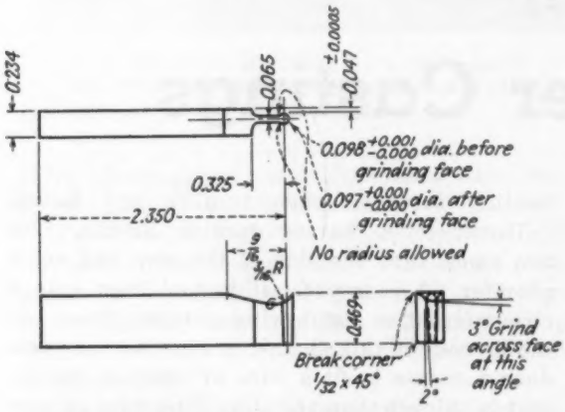


FIG. 2—This special tool is used in the setup shown in Fig. 1, for cutting a circumferential wire groove of 0.098 in. diam in typebar segments.

Segments for sublevers are aluminum castings and are much larger than the cast iron typebar segments. After some preliminary operations, these castings are clamped, two at a time, in a special indexing fixture on a Brown & Sharpe No. 000 milling machine, as shown in Fig 3. The fixture indexes automatically before each of the 42 slots is cut and then is fed automatically into the cutter which turns continuously but is not traversed. Cimcool coolant is fed in a stream from a pipe above the cutter. The cycle is automatic and requires 2½ min for two segments. Three machines are tended by one operator who merely loads and unloads the fixtures and starts the cycle.

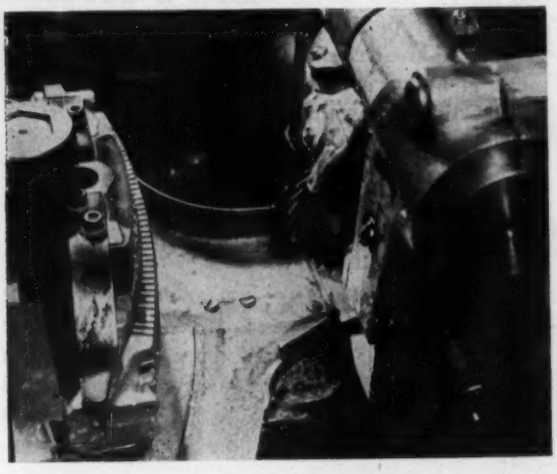
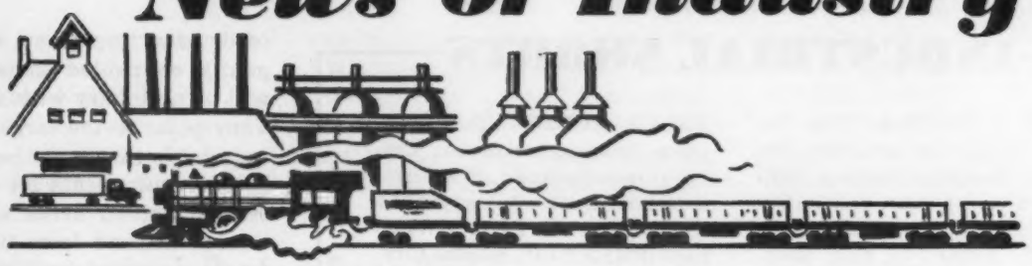


FIG. 3—Radial slots are cut in two cast aluminum sublever segments held in this indexing fixture on a Brown & Sharpe milling machine, the work being fed into the cutter on the arbor at right.

Each of these sublever segments also requires a circumferential slot, this being cut across a top face. Slotting is done on a vertical spindle milling machine equipped with a horizontal fixture that holds four segments spaced 90° apart. Slots are cut by 24 duplicate carbide tools spaced around a holder at the required radius, the holder being carried by the spindle of the machine. Cuts are made as the fixture is fed upward slowly into the rotating cutters until a slot ¼ in. deep is produced in all four segments.

The bottom of this slot also requires an undercut for a wire and it is produced by four tools set at required depth between segments and in a single slow turn of the tool holder.

News of Industry



Fast Move in Ore

Caracas — Action is being speeded to bring iron ore out of U. S. Steel's fabulous lode in Venezuela. Venezuela's Inter-Ministerial Commission has stamped its approval on the corporation's plan to move the ore out via the Orinoco River.

The favorable recommendation now goes to Junta, a top-level military triumvirate, who will render final decision. Junta is expected to go along with the recommendations of the commission.

U. S. Steel plans to move the ore down the Orinoco from a point 94 miles from the mines by seagoing ships up to 40,000 tons. Dredging the river is expected to cost much less than the 275 mile, $113 million railroad which had been favored in some circles.

Receive Army Contracts

Washington—The Army Dept. has awarded two contracts to the Russakov Can Co. of Chicago for the supply of 812,500 5-gal steel drums at a total cost of $1,454,375.

Other Army contracts include construction of ten 585-ton steel barges by the Newport News Shipbuilding & Dry Dock at $406,250, and the supply of 210,000 cartridge cases by the Norris Stamping & Mfg Co., Vernon, Calif., for $501,900.

Freight Car Deliveries Rise

New York —June U. S. freight car deliveries were 3874 against 7193 in May and 9121 in June '49, announced the American Railway Car Institute. As of July 1, order backlog was 40,585 cars.

Military Demands Soon to Hit Industry

When the orders start to roll business-as-usual will be out . . . Doubtful voluntary allocations can stand gaff . . . May need controlled materials plan—*By Tom C. Campbell.*

New York—Military demands to back up our global commitments to defend against aggression and to support the war in Korea will soon hit the domestic scene with a bang. The needs will be known soon—so soon that congressional appropriations may be a slow second.

Civilian Orders to Wait

Anyone who expects that business will continue as usual when the orders start to roll forget his primer. There is no possible way to give top ranking orders for war the right of way and still make all the butter the people want.

Within the next several weeks it is expected that steel mills and manufacturing concerns will begin pushing back civilian orders. No outright eliminations can be expected as long as an all-out war is not the outlook.

Back to Washington

But there is plenty of evidence from 1940 and 1946 to indicate that soon those who want the so-called luxuries that seem to be available only in the United States will have to wait for them. The pipelines of appliances, cars and other gadgets and badges of free economy will be cleaned out if the Korean War lasts more than 6 months.

Those who previously had experience in Washington directing voluntary allocations will find themselves back there again—perhaps this week. Just how big a job they will have is no secret. They had it before. This time it will be a cross between the essential civilian allocations of the post war period and the early war days in 1941-42.

Whether the voluntary allocation setup can stand the gaff in the next few months remains to be seen. It will depend on how much the military order and how much defense officials will demand that trucks, freight cars, pipelines, jeeps, farm implements and other assets be treated as major preferential items.

Direct Orders Mean Speed

Since defense people will in many cases be the same men who have had brutal experience with allocations, it is clear this week that the going will be rough for civilian demand—if it conflicts with military or auxiliary orders.

Someone has to be responsible for the swift passage of rules to give defense orders first call on industry. As it stood a week or so ago steel firms were doing all that was asked of them to give a green light to what they thought was important. But allocations and direct war and material orders okayed by defense people are the only way things can move fast to support the war front—and also the way that will put a crimp in business-as-usual.

Some people in the know are al-

INDUSTRIAL SHORTS

NAVY CONTRACTS—The Navy Dept. has awarded two engine contracts totaling $33,652,401 to the Pratt & Whitney Aircraft Div., UNITED AIRCRAFT CORP., of East Hartford, Conn. Other contracts include: Worth Steel Co., Claymont, Del., 796.6 tons of steel plates; and Norris Stamping & Mfg. Co., Vernon, Calif., 141,714 cartridge tanks.

TAKES OVER—Federated Metals Div. of AMERICAN SMELTING & REFINING CO., New York, has acquired the business of White Bros. Smelting Corp., Philadelphia producers of Certificate brass ingot, phosphor copper and smelters of copper bearing materials. The entire personnel of White Bros. is being retained.

CONSOLIDATING—The entire plant and property of the Cincinnati Planer Co., Oakley, Ohio, has been acquired by the KIRK & BLUM MFG. CO., Cincinnati dust and fume control manufacturers. Kirk & Blum's five warehousing and manufacturing facilities throughout Cincinnati will be consolidated in the Oakley plant.

SEEKS MANUFACTURER—Announcement has been made by THOMAS F. RUTLEDGE, c/o S. Shamash & Sons, Inc., 91 Wall St., New York, that a Belgian producer of a piece of railroad equipment, the Locopulseur, used to switch freight cars up to 250 tons, is seeking a manufacturer in the United States. The American firm would manufacture the item for this country, Mexico and the Philippines on a license and royalty basis.

NEW PIPE PLANT—Operation has begun in the new $2 million plant of the ALABAMA PIPE CO., Anniston, Ala. It is making high pressure pipe for water mains and has three centrifugal casting machines in operation.

TRUCK AGENT—The Automatic Transportation Co., Chicago manufacturer of electric industrial trucks, has appointed INTER-STATE INDUSTRIAL EQUIPMENT CO., Kansas City, as its representative. The newly organized sales firm is headed by Earl R. Calvin.

ORDER OF MERIT—Dr. Arthur M. Wahl, scientist at the Research Laboratories, WESTINGHOUSE ELECTRIC CORP., Pittsburgh, has been awarded the company's highest honor—the Westinghouse Order of Merit.

P. A. OFFICERS—Roy W. Pitts, purchasing agent for the Atlantic Steel Co., Atlanta, has been installed president of the PURCHASING AGENTS' ASSN. OF GEORGIA. C. H. Held and Graham Mitchell are vice-presidents; P. J. Rogers, secretary; and W. H. Bryant, treasurer.

MANUFACTURER'S REP.—Wickwire Bros., Inc., Cortland, N. Y., has named the JOHN J. GILLIS CO. its New England representative for all its products, including insect wire screening, poultry netting, miscellaneous nails and brads, and manufacturers low carbon wire of all kinds.

ADDING FACTORY—The SOUTHERN CHAIN & MFG. CO., which maintains a warehouse and sales office in Birmingham, has announced that it will lease or build a factory within the next 3 months to manufacture industrial and commercial chain.

EASTERN OUTLET—National Broach & Machine Co., Detroit, has appointed the TRIPLEX MACHINE TOOL CORP., New York, as sales representative for all domestic business in this area. F. P. Harrigan, Newark, N. J., will continue as representative on all export sales in the New York area.

ready expecting that a more stringently controlled materials plan will be necessary within 3 months. They point to the large volume of war goods that must be made, the heavy requirements for revived essential civilian needs and the incessant demand from the domestic front as people recall their previous experiences.

If CMP comes, the same steel and other industrial officials who did such a good job in the last war will be available. They will not have time to volunteer; they will be drafted by acclamation. One thing is certain to those who are watching every angle of the present emergency—a full blown domestic boom is just not possible now. At least as far as new production is concerned.

AFL and CIO Plan Harmony Talks to Narrow Policy Breach

Barriers to unity still exist . . . Some relenting of factions seen.

New York—Merger talks to close the AFL-CIO schism will be held among union hierarchy starting July 25. The same roadblocks of disagreement on policy that continued the breach still exist. But that negotiations were agreed upon at all signals that the labor factions may be willing to do some budging on stubbornly held positions.

"Not So Fast"

Strife was always caused in past harmony talks when the CIO insisted on quick establishment of working unity and alliance in political machination, while the AFL condemned CIO philosophy as premature. They insisted that CIO aims were not feasible until internal unity had been achieved. The CIO's cleanup of communist campaign may make the AFL more amenable.

CIO President Philip Murray has asked the institution of a joint standing committee to develop intensified labor cooperation. Acceptance came from John L. Lewis the machinists and railroad trainmen unions. The AFL, in effect said "not so fast." It will give

its views at the coming talks. Delegations will be headed by Murray and AFL President William Green.

Meanwhile labor was all unity at special emergency policy and planning talks held with National Security Resources Board chairman W. Stuart Symington in Washington last week. In a joint statement, Mr. Green announced that a committee of nine would plan for emergency mobilization of labor.

Wave of Inventory Buying Reported

Official statements imply business-as-usual . . . But PA's turn about in buying policy . . . Blame uncertainties over military needs while Washington decides—*By Bill Packard*

New York — Some purchasing agents who had been highly skeptical of any forward buying for inventory have done a complete turnabout since the shooting started in Korea. This has caused an upsurge in demand for many commodities, from raw materials to finished goods. Although the pressure is stronger on items that had been known to be in short supply, items which had been relatively easy are now feeling it plenty.

Heavy buying by industry has been reported during the past week in such varied commodities as metals, rubber, paper, sugar and certain chemicals. In addition, when the retail figures are in, they will show that consumers have been rushing in to buy such items as new and used cars, appliances, nylon goods and some foodstuffs.

They Don't Believe It

Of course this is in conflict with official "business-as-usual" statements from government and industry. The reason is simple. The people who do the buying just don't believe it. That goes for the private consumer as well as the industrial purchasing agent. Actions speak louder than words—and they are on a buying spree.

Government and industry have this one thing in common: they would both like to prevent a consumer stampede on scarce items. Neither wants another round of costly inflation. In addition to the usual reasons for wanting to hold the price line, both know that some wages are now tied to the cost of living, which means that higher prices mean higher wages—automatically.

PA's Busy as Bees

In the metals field purchasing agents have been as busy as bees. Swarming on steel sales offices has had little effect because current production has been booked for a long time, and steel producers are increasingly reluctant to book tonnage too far ahead until a clear-cut plan of distribution is doped out.

But buying of nonferrous metals has been heavy during the past week. This quickly resulted in higher prices for lead and tin. The action in lead was somewhat of a surprise since lead stocks had been considered good and recent imports have been at a rate almost equal to domestic production. Undoubtedly, reports that the government would change its mind and stockpile lead during the second half of the year touched off some forward buying by firms that had been operating almost on a hand-to-mouth basis in a weak market.

Other nonferrous metals had been showing consistent strength for several weeks. The Munitions Board says it definitely has not increased its stockpile buying of nonferrous metals except copper. Copper reserves have been low and consumption high, but June shipments were the highest in more than 2 years.

One thing is sure—the buying of the past week has not been measured against immediate production requirements. It has been precautionary buying measured against future uncertainty. It is based on fear that military requirements will be large enough to cause severe shortages.

This precautionary buying will continue until Washington decides what and how much is needed, who is to make it, and how materials are to be distributed. Meanwhile, industry is playing it safe.

Wings Into War Clouds

San Diego — Warplanes on furlough at storage bases will be readied for combat under the terms of an $8 million contract awarded to the Douglas Aircraft Co. by the Air Force. The contract entails work on an unspecified number of B-26 bombers. Superfortresses off-duty at the Davis-Monthan Air Force Base, outside Tucson, Ariz., will get similar treatment.

German Steel at High Rate

Frankfurt, Germany—Steel production in Germany was at an annual rate of 11,300,000 metric tons during the first half of 1950. This was the highest for any similar period since the end of World War II.

British Steel Output Hits Record

London—British steelmakers set an all-time production high with 8,300,000 tons for the first half of 1950, bettering the first half of 1949, former record period, by 351,000 tons, reported the British Iron and Steel Federation. June was also a record month in which an annual rate of 16,249,000 tons were produced.

Opens Alloy Research Unit

Chicago—Research facilities for the development of custom tailored alloys for industry have been opened by Specialloy, Inc., at their Chicago plant. The firm will also produce high strength, high temperature alloys for advance design equipment.

Malleable Castings Output to Gain in '50

Industry spokesmen predict 850,000 ton shipments for 15 pct gain . . . Business excellent . . . High automotive production helps . . . See quick growth with war—*By Bill Lloyd.*

Cleveland — While outlook for the malleable castings industry like most other industries will be materially affected by developments in Korea, shipments this year are expected to total about 850,000 tons, a 15 pct increase over 1949, industry spokesmen predicted this week.

Basis of Prediction

Factors prompting this prediction include the following: (1) Business at the moment is excellent according to industry sources. Following an upturn in orders in January, backlogs have been building up gradually, accompanied by an increase in monthly shipments. (2) Average work week in the malleable industry in June was 40.1 hrs as compared to 32 hrs a year ago. (3) Operating rates are higher with malleable foundries in the East averaging 70 to 90 pct of capacity and in the West 80 to 100 pct. Several are operating at more than 100 pct of capacity. (4) Employment in the industry has been increasing. According to industry sources employment in May was substantially higher than the January level.

Statistics on first-half shipments are not yet available but indications are that they will show an increase over the corresponding period of last year.

Another factor is the continued increase in production of pearlitic malleable which has increased about 50 pct since 1945 and is presently higher than in any preceding year. Production of this type this year is expected to top 1949 production by 20 to 25 pct.

Demand from specific major segments of the malleable market shows no sign of letup. Record-breaking production of automobiles and trucks means good business for malleable founders specializing in automotive requirements. Car and truck production normally accounts for about 53 pct of the industry's average annual output.

With War—Growth

Railroad producers, another important market, indicate a continued improvement in the outlook and it is believed that total tonnage for building will be substantially greater than 1949.

Requirements of the agricultural implement industry are holding up.

If the situation in Korea turns out to be a preliminary to a major war, the malleable castings business will mushroom. Military vehicles require large number of malleable castings and tonnage requirements for spare parts as re-

STEEL PRODUCTION (Ingots and Steel for Castings)

As Reported to the American Iron & Steel Institute

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated Weekly Production (Net Tons)	Number of Weeks in Month
	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity		
January, 1950	7,131,519	96.5	379,252	80.6	419,601	71.9	7,930,372	93.9	1,790,152	4.43
February	6,142,178	92.0	255,565	60.2	395,502	75.0	6,793,245	89.1	1,696,311	4.00
March	6,747,680	91.3	265,726	56.5	473,630	81.1	7,487,036	88.7	1,690,076	4.43
1st Quarter	20,021,377	93.3	900,543	65.9	1,288,733	76.0	22,210,653	90.6	1,727,111	12.86
April	7,314,733	102.2	407,909	89.5	490,030	86.7	8,212,672	100.4	1,914,376	4.29
*May	7,597,837	102.8	437,006	92.9	517,044	88.6	8,551,887	101.3	1,930,449	4.43
†June	7,217,002	100.8	406,944	89.3	506,983	89.7	8,130,929	99.4	1,895,321	4.29
†2nd Quarter	22,129,572	102.0	1,251,859	90.6	1,514,057	88.3	24,895,488	100.4	1,913,566	13.01
†1st 6 months	42,150,949	97.7	2,152,402	78.3	2,802,790	82.2	47,106,141	95.5	1,820,879	25.87
January, 1949	7,289,865	101.2	408,552	92.6	498,973	96.1	8,197,390	100.4	1,850,427	4.43
February	6,635,765	102.0	379,698	95.3	478,479	102.0	7,493,942	101.6	1,873,485	4.00
March	7,476,139	103.7	430,176	97.5	495,481	95.4	8,401,796	102.9	1,896,568	4.43
1st Quarter	21,401,769	102.3	1,218,426	95.2	1,472,933	97.7	24,093,128	101.6	1,873,494	12.86
April	7,017,712	100.6	404,095	94.6	374,358	74.4	7,796,165	98.6	1,817,288	4.29
May	6,891,293	95.6	400,741	90.9	306,956	59.1	7,598,990	93.0	1,715,348	4.43
June	5,956,402	85.4	349,196	81.8	199,058	39.6	6,504,656	82.2	1,516,237	4.29
2nd Quarter	19,865,407	93.9	1,154,032	89.1	880,372	57.7	21,899,811	91.3	1,683,306	13.01
1st 6 months	41,267,176	98.1	2,372,458	92.1	2,353,305	77.6	45,992,939	96.4	1,777,848	25.87
July	5,309,060	73.8	300,236	68.2	175,535	33.9	5,784,831	71.0	1,306,785	4.42
August	6,103,326	84.7	355,335	80.6	264,110	50.9	6,722,771	82.3	1,517,556	4.43
September	5,994,100	86.1	350,282	82.2	253,553	50.5	6,597,935	83.6	1,541,574	4.28
3rd Quarter	17,406,486	81.5	1,005,853	76.9	693,198	45.0	19,105,537	78.9	1,455,106	13.13
9 months	58,673,662	92.5	3,378,311	87.0	3,046,503	66.6	65,098,476	90.5	1,669,192	39.00
October	814,618	11.3	.....	.....	113,729	21.9	928,347	11.4	209,559	4.43
November	3,806,870	54.6	172,270	40.3	243,989	48.5	4,223,129	53.4	984,412	4.29
December	6,953,653	96.7	396,075	90.0	378,496	73.0	7,728,224	94.8	1,748,467	4.42
4th Quarter	11,575,141	54.2	568,345	43.4	736,214	47.8	12,879,700	53.2	980,190	13.14
2nd 6 months	28,981,627	67.8	1,574,198	60.2	1,429,412	46.4	31,985,237	66.0	1,217,558	26.27
Total	70,248,803	82.3	3,946,656	76.0	3,782,717	61.9	77,978,176	81.1	1,495,554	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,668,287 net tons open hearth, 106,195 net tons Bessemer and 131,786 net tons electric ingots and steel for castings, total 1,906,268 net tons; based on annual capacities as of January 1, 1950 as follows: Open hearth 86,984,490 net tons, Bessemer 5,537,000 net tons, Electric 6,871,310 net tons, total 99,392,800 net tons.

* Revised.

† Preliminary figures, subject to revision.

Note—The percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons Bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of January 1, 1949 as follows: Open hearth 84,617,040 net tons, Bessemer 5,191,000 net tons, Electric 6,112,890 net tons, total 96,120,930 net tons.

* Revised January through December, 1949.

placements could be substantial.

At the moment malleable castings producers report no raw material problems of any consequence. Thus far they are getting adequate supplies of iron and scrap.

To meet a possible emergency the malleable industry is adequately equipped to produce at least a million tons of castings a year as a result of the expansion and modernization in the past several years.

Washer Sales at Near Record

Atlantic City, N. J.—Household washers are being sold at a rate close to the industry's all time high of 1948. Washers sold so far this year passed the 2 million mark early this month, according to preliminary estimates announced by H. P. Nelligan, president of the American Laundry Manufacturers Assn. The total for slightly more than half this year is two thirds that of 1949 when 3,033,106 were sold.

Order 400 Liaison Planes

Washington — Recent adoption of the Cessna 305 single motor plane as an official reconnaissance plane, designated the L-19A, has been followed by an Army order for 400 planes. Including parts and equipment the order totals around $5 million.

Military production will be fitted into present commercial output schedules but first military deliveries are asked for December. The contract is to be completed by the end of 1951.

Start on Alabama Pipelines

Birmingham — J. W. Goodwin Engineering Company of Birmingham has contracts for construction of natural gas distribution systems in 68 Alabama towns and cities to be connected to the new $32,000,000 gas pipeline being constructed by Southern Natural Gas Company from Mississippi gas fields to Aiken, S. C. Cost of the 68 distribution systems is estimated at $45,000,000. Work on some has already started.

Fabricators, Business Revives, Steel Scarce

Midwest fabricators operate at up to 100 pct capacity . . .
Prices up in past 4 months, backlogs good but steel short . . .
Business in early '50 was weak—*By Gene Beaudet.*

Chicago—Structural fabricators in this area have witnessed the revival of sounder business after the early 1950 and 1949 letup and are now operating at up to 100 pct of capacity. Sour note in the midst of plenty is the scarcity of steel, structural shapes, sheets, plates, and wide flange sections.

Picks Up to 100 Pct

In the past 4 months prices have improved considerably and noses are turned up at jobs that will not bring a good return. Backlogs are now stretching to about 4 months and one fabricator here reports a 33 pct increase over 1949, which he expects to average out for the entire year as 25 pct over 1949.

Another firm that last March had restricted its bidding because of poor prices and was limping along at 65 pct of capacity is today working at 100 pct and owns an impressive backlog. Generally, extended backlogs, good prices, and appreciable number of jobs awaiting bids are reported.

These past months of quickening activity are in contrast to bleaker days in January '50 after industry had felt business sink in the second and third quarters of 1949 and shelved many plans for expansion. Industry kept a wary eye on improving conditions to determine their permanence.

Bare Pickings

Early this year a large part of new construction undertaken was of the institutional type. Structural shapes were plentiful and salesmen were actively selling not merely taking orders. Industrial contracts let for industrial, commercial and highway construction in the first 3 months of '50 became more numerous. Fabricators entered into intense competition. Many refrained from bidding,

May Finished Steel Shipments

As Reported to the American Iron & Steel Institute

STEEL PRODUCTS		May.					To Date This Year				
		Carbon	Alloy	Stainless	Total	Per cent of Total Shipments	Carbon	Alloy	Stainless	Total	Per cent of Total Shipments
Ingots	1A	57,621	11,217	1,123	69,961	1.1	233,970	47,407	6,623	288,000	1.0
Blooms, slabs, billets, tube rounds, sheet bars, etc.	1B	134,428	35,610	1,018	171,056	2.7	690,141	163,794	3,979	857,914	3.0
Skelp	2	13,695	-	-	13,695	0.2	44,114	-	-	44,114	0.2
Wire rods	3	74,771	1,003	66	75,840	1.2	338,077	6,129	462	344,668	1.2
Structural shapes (heavy)	4	361,836	2,219	89	364,084	5.8	1,647,933	14,445	114	1,662,492	5.9
Steel piling	5	38,304	-	-	38,304	0.6	123,988	-	-	123,988	0.4
Plates	6	430,165	15,936	851	446,952	7.1	2,084,582	59,433	4,287	2,148,302	7.6
Rails—Standard (over 60 lbs.)	7	179,165	-	-	179,165	2.9	707,962	8	-	707,970	2.5
Rails—All other	8	9,952	34	-	9,986	0.2	45,574	123	-	45,697	0.2
Joint bars	9	10,903	-	-	10,903	0.2	46,231	-	-	46,231	0.2
Tie plates	10	44,036	-	-	44,036	0.7	177,172	-	-	177,172	0.6
Track spikes	11	12,947	-	-	12,947	0.2	54,447	-	-	54,447	0.2
Wheels (rolled & forged)	12	22,729	7	-	22,736	0.4	97,462	50	-	97,512	0.3
Axles	13	11,881	36	-	11,917	0.2	37,566	286	-	37,852	0.1
Bars—Hot rolled (incl. light shapes)	14	531,797	167,638	2,086	701,521	11.2	2,424,930	784,666	10,402	3,219,998	11.3
Bars—Reinforcing	15	137,615	-	-	137,615	2.2	595,930	-	-	595,930	2.1
Bars—Cold finished	16	111,916	19,513	2,180	133,609	2.1	515,799	95,786	9,872	621,397	2.2
Bars—Tool Steel	17	1,318	5,723	-	7,041	0.1	6,068	25,747	-	31,815	0.1
Standard pipe	18	235,671	28	2	235,701	3.8	1,084,967	28	6	1,085,001	3.6
Oil country goods	19	125,307	20,283	-	145,590	2.3	582,199	87,818	-	670,017	2.4
Line pipe	20	341,455	-	-	341,455	5.5	1,443,696	-	-	1,443,696	5.1
Mechanical tubing	21	43,071	18,343	210	61,624	1.0	* 190,340	79,161	* 1,159	* 270,660	1.0
Pressure tubing	22	16,616	1,512	627	18,755	0.3	* 85,178	10,068	* 2,813	* 98,059	0.3
Wire—Drawn	23	223,012	3,791	1,687	228,490	3.7	1,120,547	15,619	8,037	1,144,203	4.0
Wire—Nails & staples	24	76,180	-	33	76,213	1.2	365,410	-	66	365,476	1.3
Wire—Barbed & twisted	25	22,269	-	-	22,269	0.4	98,947	-	-	98,947	0.3
Wire—Woven wire fence	26	45,965	-	-	45,965	0.7	204,379	-	-	204,379	0.7
Wire—Bale ties	27	6,807	-	-	6,807	0.1	22,172	-	-	22,172	0.1
Black plate	28	44,810	-	-	44,810	0.7	200,752	-	-	200,752	0.7
Tin & terne plate—hot dipped	29	170,711	-	-	170,711	2.7	733,721	-	-	733,721	2.6
Tin plate—Electrolytic	30	261,181	-	-	261,181	4.2	1,124,462	-	-	1,124,462	3.9
Sheets—Hot rolled	31	651,233	22,454	2,693	676,380	10.8	3,013,067	92,433	11,467	3,116,967	11.0
Sheets—Cold rolled	32	764,778	10,890	8,825	784,453	12.5	3,618,508	38,049	40,805	3,697,362	13.0
Sheets—Galvanized	33	195,442	2,631	-	198,073	3.2	952,396	12,002	-	964,398	3.4
Sheets—All other coated	34	19,667	-	-	19,667	0.3	91,328	-	-	91,328	0.3
Sheets—Enameling	35	23,942	-	-	23,942	0.4	102,689	-	-	102,689	0.4
Electrical sheets & strip	36	10,120	55,014	-	65,134	1.0	38,378	236,222	-	274,600	1.0
Strip—Hot rolled	37	196,998	2,461	470	199,929	3.2	883,928	17,236	3,372	904,530	3.2
Strip—Cold rolled	38	137,697	1,852	15,008	154,557	2.5	659,955	4,987	68,151	733,093	2.6
TOTAL		5,818,215	397,555	36,908	6,252,678	100.0	26,428,939	1,791,437	171,615	28,371,991	100.0

During 1949 the companies included above represented 99.4% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.

others took losses to get work, and some breathed lightly because they were able to break even.

Steel in Scarcity

Now fabricators are not confronted by too-few contracts but they cannot get all the steel they need to fill these lettings. Mill deliveries on structural shapes extend about 4 or 5 months and plates are almost as critical as sheets. A few fabricators report losing jobs because companies refuse to wait for deliveries and turn to other fabricators who might have steel.

First put on allocation by local mills for the third quarter last June and now sold out, structurals were among the last steel items to tighten up. In greater shortage are wide flange sections and one eastern producer shipping here stopped taking third quarter orders 5 weeks ago.

Two weeks ago the same was true for standard structurals. Another outside producer's Chicago area tonnage is sold out on structurals and reinforcing bars for the rest of the year. A large tonnage carryover is expected at the end of the third quarter. Some mill men foresee the structural shortage edging up to the critical stage of flat rolled products by the end of the year.

Washington Weighs Chrome Supply in Crisis

War could disrupt or sever Philippine, Turkish supply . . . Russia halts exports . . . Industry needs at least 650,000 tons . . . Marshall Plan money helps—*By Karl Rannells.*

Washington—Trouble in the Far East has started government officials weighing, literally and figuratively, the domestic stocks, needs, and supply sources of chrome ore—a vital ingredient in alloys and heat and corrosion resistant steels.

U. S. Production Minor

Domestic production is a negligible factor in meeting needs. Russia, a former major source, has cut off all chrome ore exports to this country and the national stockpile supply is too scant to be more than a feeder during a prolonged period of emergency such as war.

Outbreak of full-scale war could disrupt, if not sever, supplies from two other major sources, Turkey and the Philippines, which have shipped the U. S. more than a fifth of its postwar imports.

Mines Only 2 Pct

With national consumption about 750,000 tons, maintenance of steel production at the 100 million ton level would require at least 650,000 tons and any upward fluctuation in demand for alloy steel would raise this figure accordingly.

While America uses about 48 pct of world chrome ore production, it mines only about 2 pct of its normal needs. Highest domestic production, spurred by war needs, reached 62,000 tons. Postwar average was 2500 tons.

In 1948, U. S. consumption was roughly 780,000 tons—353,000 tons of metallurgical grade, 292,000 of refractory grade, and 135,000 of chemical grade. Imports were nearly double that amount.

It was the first time since 1941 that the new supply exceeded consumption in any sizable amount. Prewar consumption just about equalled imports. But from 1940 through 1948, the new supply topped consumption by about 1,760,000 tons. Presumably this was used to build up industrial stocks and the national stockpile.

Study Subgrade Ore

During the war about 310,000 tons were mined domestically and acquired by the Metals Reserve Co. Of this, about 60,000 tons went into domestic channels. The remaining 250,000 tons was admittedly subgrade but in an emergency would be better than nothing. The Bureau of Mines has been testing a method of grinding and mixing subgrade ores with higher grade imported friable. Unpublished reports indicate that this has been fairly successful.

Russia Cuts U. S. Off

About 90 pct of U. S. imports during the first 3 postwar years was supplied by six countries — Union of South Africa, 701,300 tons; Russia, 676,800 tons; Cuba, 475,700; Philippines, 422,000 tons; Turkey, 290,100 tons; and Southern Rhodesia, 269,800 tons.

Russian exports of chrome to this country had risen steadily from 27,000 tons in 1942 to a record high of 352,000 in 1948. But Russian shipments dropped to about 95,000 tons in 1949, mostly during the first quarter. Through April 1950 none at all had been received.

Hot Spot Location

This decrease by Russia has been partially offset by increased Turkish ore exports which rose from 52,000 tons in 1947 to 200,000 tons in 1948 and 227,000 in 1949.

Turkey thus becomes the second biggest U. S. supplier of chrome ore, whose 1949 shipments were surpassed only by South Africa with an average of 230,000 tons for the past 3 years.

Two ailments beset the Turkish

supply. Known reserves could be mined out within a dozen years unless new mines are developed. Turkey has an unfavorable location to Communist or satellite nations.

Marshall plan money has already been used to step up Turkish production by providing mining, roadbuilding, and other equipment for mine development. Officials are also studying plans on how to help other U. S. suppliers, such as New Caledonia and Rhodesia. Modern equipment, financial and technical assistance may be furnished.

Erie Forge Co., Subsidiary Sold to Expansion-Minded Group

New York—Erie Forge Co. and its wholly-owned subsidiary, the Erie Forge & Steel Co. is in the hands of a group of industrialists and businessmen who plan expansion.

Virtually all of the capital stock was bought for $4,500,000 by the new owners, headed by E. Richard Ebe and Mortimer S. Gordon, both of New York City, announced E. H. Lang, Erie president. He will retain his post with his associate officers.

Plants and 100 Acres

One of the largest Diesel crankshaft producers in America, Erie has five acid openhearth furnaces and plants covering 100 acres. Other equipment includes steelmaking, heavy forge, steel foundry, and heat treating and testing facilities. The plants also have machine shops for rough and finished machining.

Expansion plans involve adding large forge presses. Erie products are shafting, Diesel crankshafts, and rotor forgings for turbine apparatus and generators.

PMMI to Meet in Hot Springs

New York—The Packaging Machinery Mfrs. Institute is planning its annual meeting for September 23 to 26 in Hot Springs, Va. The business meeting and industry planning conference are scheduled for September 25 and 26.

Armco Celebrates Birthday

Middletown, Ohio—Last week Armco Steel Corp. threw a birthday party here and invited the whole county to come have some fun. Come they did—more than 40,000 enjoyed themselves 'til the last whistle blew.

Armco's first cornerstone was laid here 50 years ago. Since then the destinies of the town and the company have been molded together.

It was a great outing for the kids. But their enthusiasm hardly surpassed that of the adults, some of whom did the same things as the kids—except with more gusto.

This grass roots party told more than words what Armco thinks of the people in its community, and vice versa.

Helping serve guests in photo are Charles R. Hook, chairman of board (in apron), and W. W. Sebald, president, on Mr. Hook's left.

McKees Rocks Rail Car Plant To Become Multi-Industry Center

New York—Sold to a syndicate for reportedly more than $2 million, the 100 acres of Pressed Steel Car Co.'s shutdown McKees Rocks, Pa., plant will be leased and sold by its purchaser to transform it into a settlement of varied industry under its new name, McKees Rocks Industrial Enterprises. Equipment and machinery of the railroad freight car plant will be sold.

Headed by Leonard Morey, of the Morey Machinery Co., New York City, the syndicate also consists of the McBeth Machinery Co., Pittsburgh, and Charles Samuels Co., of Brooklyn, N. Y. The plant site is 11 miles north of Pittsburgh on the Ohio River.

Inquiries Coming In

Space exists on the property for two or three large firms and a dozen or more smaller ones, said the syndicate in disclosing that inquiries had been received from steel fabricators and two auto firms seeking manufacturing quarters. Pressed Steel announced that it had shut down and sold the plant because car orders were insufficient, the industry had surplus capacity, and because large sums would have been needed to renovate the plant for successful competition.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"The Great Unknown"

THE stock market is fumbling furiously in an effort to assess the effects of the Korean "police action." Within a 10-day trading period after the invasion of South Korea 25.4 million shares—a daily average of 2.5 million shares—were traded on the Big Board. The Dow-Jones Averages lost 16.25 points and approximately $5.5 billion were lopped from the values of the securities listed on the New York Stock Exchange.

To meet an obvious interest, one of the big statistical services immediately prepared an elaborate analysis showing the behavior of various industrial groups before, during, and after the Second World War. Although this service did not tell its subscribers that the pattern would be repeated, here was the factual material from the record for anyone who felt that the Third World War had started; that industry and security values would repeat the experience of the war that ended in the late summer of 1945.

For what it is worth in anticipating the future, 379 large companies representing 34 industries raised their net income during the period 1940-45 by 26 pct above the level of 1939. The best wartime performance, in terms of earnings, was recorded by shipping and shipbuilding, railroad equipment, and aircraft manufacturing in the order named; the poorest by gold mining, metal containers and cement. The steel industry raised its net during the war years by 60 pct.

Stock marketwise the rails did better than the industrials, showing an appreciation of 33 pct against 21 pct. The owner of utilities found his stocks selling at approximately the same level at the end as at the beginning of the war. When the Germans threw in the sponge in May 1945 steel stocks on the average were worth about 10 pct more than they were when Hitler invaded Poland.

On the basis of the record the speculator who wants to make a killing this time should load up with rubber tire, shipping, coal, fertilizer, and particularly air transport companies. He should get rid of his gold, tobacco and nonferrous metals stocks.

The trouble with this advice is that it assumes the solution of the great unknown. Is this another world war similar to the struggle which ended in August 1945? The safest answer to this question is an emphatic negative—at this time. The Soviet has never deliberately committed itself to a shooting war, exposed the home land, or jeopardized the political tenure of the Communist Party. It has always fought through stooges, with a wide-open door for face-saving retreat. There is no reason for believing that Joe, at the ripe age of 70, will deviate from this strategy.

The Pentagon hopes to increase total manpower under arms by 300,000-500,000 men. Taking the latter figure, the total of our armed forces will still be less than two million. The Chairman of the Senate Finance Committee, Senator George, believes that the discipline of the Korean Commies may cost the American taxpayer $5 billion. These are miniscule magnitudes compared to the Second World War.

They are the best estimates now available of the dimensions of the Korean action. They do not add up to a strain on the American economy. Much the greater strain on our resources is likely to come from frenzied buyers trying to anticipate wartime rationing by buying today all they may need in the future.

Proposes Pipeline to Supply Texas Gas to Pacific Northwest

Washington — With its plan to construct a 26-in. pipeline from Texas to Alberta, Canada, the Pacific Northwest Pipeline Corp., of Houston, intends to pipe natural gas into the pacific Northwest for the first time if the firm's application gets Federal Power Commission sanction.

Steel Needs Great

To stretch a distance of 2175 miles, with an added 400 miles of 22 in. and lesser sized laterals and 13 compressor stations, the pipeline will supply gas to Atomic Energy Commission plants and industry in Utah, Idaho, Washington, and Oregon.

More than 600,000 tons of steel would be needed for the line, which would cost $175 million. An estimated initial supply of 350 million cu ft of gas daily would be furnished.

The firm listed gas sales areas as the Salt Lake City region, the Snake River region, the Kellog-Wallace area, the Arco atomic energy plant, Spokane and Hanford areas, Seattle, Tacoma, Portland and Vancouver.

Pipeline Steel Need Expands

Washington — An additional 270,000 tons has been added to steel pipe and pipeline requirements since Jan 1, it is estimated on the basis of natural gas construction authorizations granted by the Federal Trade Commission.

More than 1400 miles of pipeline and connecting line construction has been approved. In addition, applications have been received seeking permission to construct another 1000 miles of facilities to require another 180,000 tons of steel.

Chicago Firm Moves Facilities

Chicago—The industrial Filter & Pump Mfg. Co. has moved its plant and general offices to 5900 Ogden Ave., Chicago. The move was made because of the need for more manufacturing space, according to company spokesmen.

Estimates of Building Steel Needs Lifted

Construction steel needs to be about 3 million tons more than had been predicted . . . Building booms and Washington alters estimates as $5 billion short . . . Plant building up.

Washington — Steel requirements for the construction industry during 1950 will be at least 3 million tons more than had been expected when the year began.

There are presently no indications of a let-up in the record-breaking building activity. Commerce and Labor Dept. experts have estimated that their pre-1950 estimates were $5 billion on the short side.

Estimates Revised

They say now that outlays will probably go above the $25 billion figure. This estimate, prepared as of July 1, made no allowance for any change in the international situation. It is adjusted, however, to allow for the fall and early winter seasonal slow-ups.

Housing construction has far exceeded expectations, first half building running nearly 50 pct ahead of last year. Where about 1,100,000 residential units had been expected earlier, the year's potential is now calculated at 1,250,000.

Plant Building Rises

Plant and factory construction, after a 2-year decline, has revived and is currently running 7 pct above last year. Store and other retail establishment construction has expanded and is a fourth more than for first half of 1949.

Privately financed residential building is expected to amount to around $10 billion, $250 million above last year. Expenditures for public housing are expected to rise from $350 million in 1949 to $400 million in 1950. This includes 50,000 housing units under the recent housing act.

OTS to Give Out Atom Reports

Washington—Under a new plan of the Atomic Energy Commission, the Commerce Dept.'s Office of Technical Services will become sales agency and reference source for non-secret AEC technical reports. Although these reports will be prepared solely by AEC, the plan will further extend the activities of OTS. The AEC will continue to distribute non-technical reports.

Allis-Chalmers Signs Labor Pact

Milwaukee — Allis-Chalmers Manufacturing Co. has signed a 5-year labor pact with the UAW-CIO, covering 10,000 production workers at the West Allis plant. A mutual securities clause provides for a modified union shop.

An immediate wage increase of 3¢ per hr is granted, to be followed by another 3¢ rise in the second year, and successive 3¢ increases each remaining year if agreed upon by both parties. The cost of living escalator clause was adopted and other benefits including pensions are in the contract.

Canada's Ingot Output Rises

Toronto—Steel ingots and castings produced in May by Canadian mills totaled 290,906 net tons for a daily average of 85.6 pct of total capacity. It showed a rise over April production of 279,320 tons at 84.9 pct of capacity but a decline from May 1949 figures of 293,179 tons at 86.3 pct of capacity. May output included 283,810 tons of steel ingots and 7096 tons of castings.

Production of pig iron in May was 195,893 net tons at an average of 84 pct as compared with April's 185,259 tons at 82.1 pct capacity. May output of ferro-alloys was 12,707 net tons against 14,627 tons in April.

Tells of All-Aluminum Bridge At Engineers Meeting in Canada

Toronto—An all-aluminum highway arch bridge, reportedly the world's first, and development of new engineering techniques to construct it were described by C. J. Pimenoff, structural designer of the Dominion Bridge Co., Ltd., at a joint meeting of the American Society of Civil Engineers and the Engineering Institute of Canada recently.

Sawing Used

Since high strength structural aluminum, an alloy of copper with strength about equal to mild steel, could not be flame-cut, welded, or subjected to 350°F heat without losing its strength, sawing was put to excellent use, he said. The light weight of aluminum facilitated transportation and for the most part no protective painting was needed.

Gun-driven cold rivets proved unsuitable and an annular rivet head for a hand-held pneumatic rivet gun was developed.

Buys Cleveland Casting Business

Cleveland — Precision casting operations under the Mercast license previously performed by this city's National Bronze and Aluminum Foundry Co. have been assumed by the Alloy Precision Castings Co., a new company which bought the facilities and license rights of National Bronze. Production will continue at the same location.

David Thomson, of Haverford, Pa., heads the new company. William I. Neismeyer, ex-president of National Bronze, is new vice-president and is in charge of the sales program.

Video Sales Volume Jumps

Philadelphia—Philco gages the success of its recent convention appliance by orders for the new Philco television models which indicate a volume five times as great as a year ago, said Fred D. Ogilby, vice-president of sales, Television and Radio Div.

Northern Coal Men Join To Bargain Better with UMW's Lewis

Operators of Assn. have over 150 million tons of annual production.

Pittsburgh — Northern coal operators controlling more than 150 million tons of annual production have formed a permanent organization, Bituminous Coal Operators Assn., to bargain more efficiently with John L. Lewis and his United Mine Workers.

"Captive" Coal Represented

Although he has not been formally approached as yet, it is understood that Harry M. Moses, president of the H. C. Frick Coke Co., a U. S. Steel Corp. subsidiary, will be asked to head the group. About a third of the tonnage represented is understood to be "captive" coal produced for steel production.

To Discontinue Steel Plants

London—Two government-owned, uneconomic stopgap steel producing plants in Leeds, Yorkshire, and Paisley, Scotland, will be eased out of operation now that English capacity for making crude steel is balancing with rolling and finishing capacity.

The Leeds works was bought and the Paisley plant built to meet war needs by the Ministry of Supply. Losses have been met by public funds and they have been managed cooperatively by other steel firms acting for the Ministry.

Seek FTC Pipeline Permission

Washington — Authorization to construct a $145 million, 1500-mile natural gas pipeline system from the Gulf Coast to outlets in Michigan, Indiana and Ohio has been asked of the Federal Trade Commission by the Valley Gas Pipe Line Co., Inc., of Houston.

The proposal includes use of 1000 miles of 30-in. line, 500 miles of 24-in. line, and the necessary laterals for supply and distribution. Several compressor stations comprising more than 100,000 hp would be installed along the lines.

K-F Gets New Gear Source To Continue Peak Production

Detroit—Fast foot work by the procurement officers of Kaiser-Frazer averted a shutdown of the Willow Run plant just as production hit a peak of 800 units per day. A 6-day strike at Warner Gear Co., Muncie, Ind., Borg-Warner subsidiary, which manufactures transmission and overdrives is responsible for the threat to K-F production.

Originally it was feared that 10,000 workers would be idled but arrangements have been made for a new source of transmissions which will enable K-F to call back half of its workers a company spokesman has announced.

Military Orders Top 1949

Detroit — U. S. Government orders totaling nearly a quarter of a billion dollars have been placed by the Detroit Ordnance District during the fiscal year ended June 30, it has been announced.

Most of the orders are for military vehicles although parts, tools and equipment are included in the total. Approximately 50,000 vehicles were ordered by the Army, Air Force and the Navy.

Lt. John M. Cone, Deputy Chief, Detroit Ordnance District, said the total is $64 million above the amount placed during the previous year and includes 10,400 contracts for 36,000 items. None of the orders was placed because of the Korean war, Cone said.

Titanium Pigment Output

New York—Immediate construction of new facilities for production of paint-making titanium pigments at the St. Louis plant of the National Lead Co. is the firm's first step in increasing production by 60,000 to 70,000 tons annually.

Initial production is slated within a year with full production to follow within 18 months. Production of titanium pigment has reached 450,000 tons annually, reflecting increased demand.

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

600 **Tons,** Omaha, office building Northern Natural Gas Co., to Maxton and Vierling Iron Works, Carter Lake, Iowa.

500 **Tons,** Chicago, Wells Street approach to 12th Street viaduct, to American Bridge Co.

500 **Tons,** Hammond, Ind., Tri-State Highway Bridge, to American Bridge Co.

345 **Tons,** two warehouses, track shed and alterations, National Gypsum Co., Clarence, N. Y., to the Ernst Construction Co., Buffalo; John W. Cowper Co., Inc., Buffalo, general contractor.

300 **Tons,** Chicago, Fester Avenue Bridge, to American Bridge Co.

266 **Tons,** Los Angeles, Calif., bridges at intersection with Ramona Parkway to provide multi-lane divided highway on Rosemead Boulevard between Garvey Avenue and Valley Boulevard through Vido Kovacevich Co., South Gate, Calif., to Apex Steel Corp., Los Angeles.

255 **Tons,** New library, Buffalo State Teachers College, Buffalo, to the Buffalo Structural Steel Co., Buffalo, John W. Cowper Co., Inc., general contractor.

225 **Tons,** Oklahoma, Santa Fe R. R., to Consolidated Steel Corp., Orange, Tex.

215 **Tons,** Clark County, Wis., bridge project T-053/-1/, to Wausau Iron Works, Wausau, Wis.

185 **Tons,** Decatur, Ill., Illinois Power Co. Transmission lines to Blaw-Knox Co., Pittsburgh.

115 **Tons,** Eau Clair County, Wis., bridge project S-0150, to Lakeside Bridge and Steel Co., Milwaukee.

Fabricated steel inquiries this week included the following:

1054 **Tons,** Venango County, Pa., construction of an I-beam bridge; 2 divided highways. Secretary of Highways, Harrisburg, Pa. Bids due July 28.

659 **Tons,** Schuylkill County, Pa., construction of divided highway. Secretary of Highways, Harrisburg, Pa. Bids due July 28.

414 **Tons,** York County, Pa., construction of an I-beam bridge. Secretary of Highways, Harrisburg, Pa. Bids due July 28.

400 **Tons,** Chicago, North Laramie Street superstructure. Bids due July 24.

141 **Tons,** Jefferson County, Pa., construction of reinforced concrete pavement and an I-beam bridge. Secretary of Highways, Harrisburg, Pa. Bids due July 28.

Reinforcing bar awards this week included the following:

341 **Tons,** Los Angeles, Calif., bridges at intersection with Ramona Parkway to provide multi-lane divided highway on Rosemead Boulevard between Garvey Avenue and Valley Boulevard through Vido Kovacevich Co., South Gate, Calif., to Soule Steel Co., Los Angeles.

279 **Tons,** Los Angeles, Calif., girder bridge over Hollywood Freeway at Fountain Avenue, through Oberg Bros. Construction Co., Inglewood, to Trojan Steel Co.

257 **Tons,** Yuma, Arizona, Bureau of Reclamation for Gila Valley Canal Desilt Basin, Gila Project, Imperial Dam through Macco Corp., Para-

mount, Calif., to Southwest Steel Rolling Mills, Los Angeles.

Reinforcing bar inquiries this week included the following:

414 Tons, Westmoreland County, Pa., construction of two divided highways, including nine reinforced concrete structures and one reinforced concrete bridge, and the construction of the project as a whole. Secretary of Highways, Harrisburg, Pa. Bids due July 28.

331 Tons, Schuylkill County, Pa., construction of divided highway. Secretary of Highways, Harrisburg, Pa. Bids due July 28.

Congress Differs on Voluntary Vs. Compulsory Steel Rationing

Washington—Congress appeared this week to regard a return to steel rationing as "inevitable," but expressed sharply-divided opinion as to whether such controls should be administered on a compulsory or a voluntary basis.

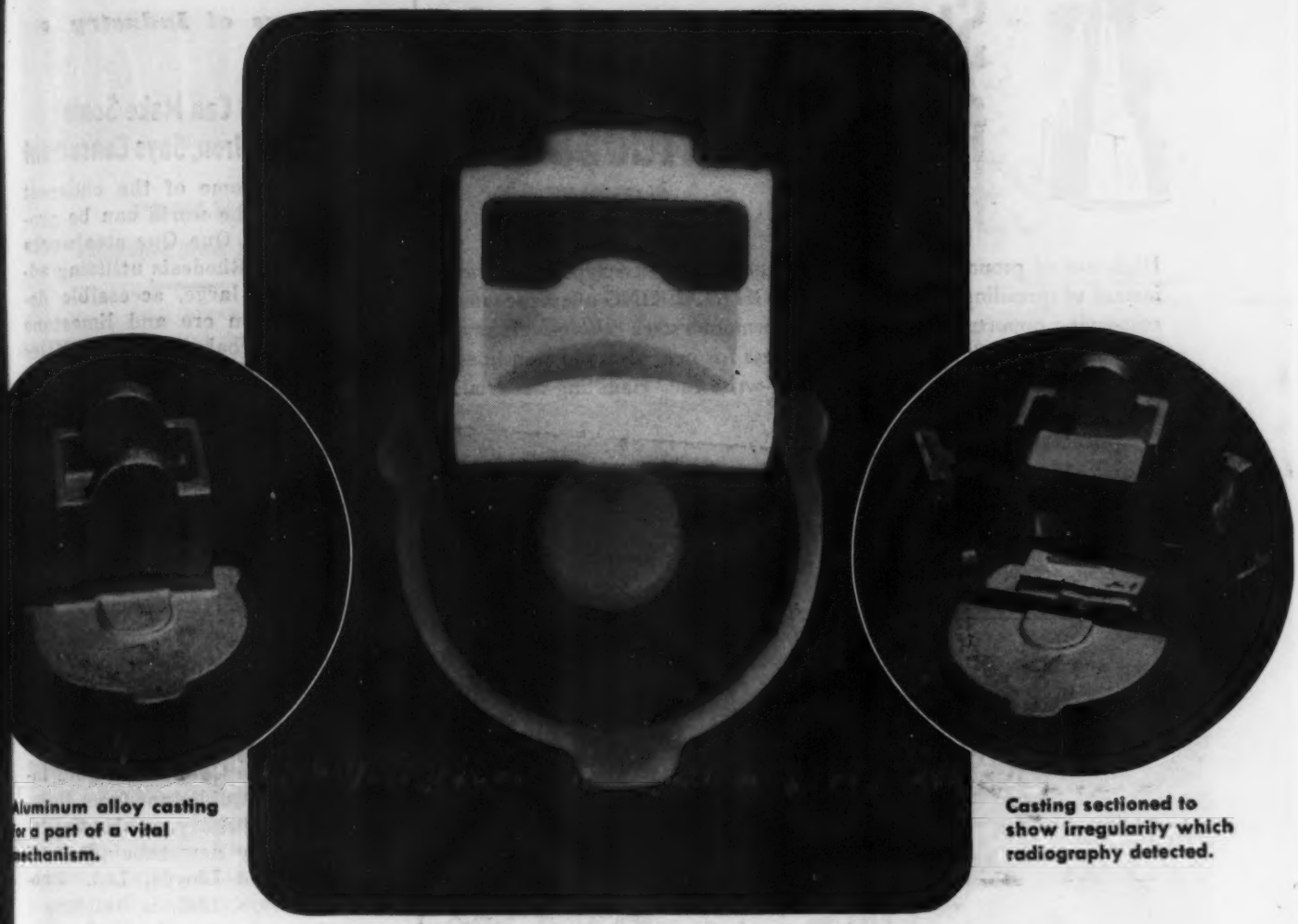
Leaders of both parties are studying President Truman's request for price and allocation powers on a "standby" basis. The White House view is that such powers should be enacted promptly and placed "on the shelf," presumably, to be used if the nation should enter full-scale conflict.

In the House, Rep. Macy, R., N. Y., called for enactment of a voluntary-control program similar to that of 1947 and 1948. Public Law 395, administered by the Commerce Dept. during that period, permitted the rationing of steel and other products by industry, and provided that agreements entered into under this law would not be liable to antitrust prosecutions.

Sprays Polyethylene on Steel

Pittsburgh—After 2 years of developmental research, Houghton Laboratories, Olean, N. Y., has perfected a method of flame spraying polyethylene coatings on steel tanks, tank cars and processing equipment.

The polyethylene in powder form is blown through specially designed flame spraying equipment, which will deposit a tough, nonporous film in thicknesses from 1/32 to ¼ in. The manufacturer claims the process eliminates danger of pin holes and other defects which might lead to corrosion.



Aluminum alloy casting for a part of a vital mechanism.

Radiograph which revealed imperfection in the casting.

Casting sectioned to show irregularity which radiography detected.

Radiography helps prevent delays in production

ALONG with scores of other castings, this one becomes part of an intricate mechanism. Extremely high quality is a must. Machining is long, complicated, and precise. Should the casting be imperfect, not only the piece and the machining time are lost—the flow of finished parts is disrupted and a whole assembly line delayed.

This is why it pays the foundry well to check the casting radiographically. It is the one way any foundry can be certain it releases only sound castings. And, equally important, it is a way that not only detects irregularities but, at the same time, indicates ways to revise gating, venting, pouring temperature, and other variables which influence consistently good work.

Ask your X-ray dealer to explain the many ways radiography can increase your yield and cut your costs.

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Radiography...

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Que Que Mill Can Make Some Of Cheapest Iron, Says Consultant

London—Some of the cheapest pig iron in the world can be produced in the Que Que steelworks of Southern Rhodesia utilizing advantages of large, accessible deposits of iron ore and limestone and Wankie coal, said a John Miles & Partners, of London, report, to the Southern Rhodesian Legislative Assembly.

The English firm has been serving as a consultant on the expansion of the Que Que works to produce 109,000 tons of finished steel annually and 10,000 tons of foundry pig iron.

Expansion planning involves a coke oven plant, a new blast furnace, new steel plant and rolling mills at a cost of $27.5 million for gross earnings of $4,648,000 a year.

Site of Que Que, in the gold industry area equidistant from Bulawayo and Salisbury, is also the location of the new tube plant of Stewarts and Lloyds, Ltd. Rhodesian Alloys, Ltd., is building a new ferro-chrome plant 40 miles away at Gwelo near chrome ore deposits.

Sub-Contracts Awarded

New York—The Bethlehem Steel Co. was awarded a contract for the steel work and the H. H. Robertson Co. received orders for their patented all-steel flooring for the first of three 12-story office buildings to be built by the Tishman Realty & Construction Co., Inc.

The buildings are to go up on Wilshire Boulevard, in Los Angeles at a total cost of $12,000,000.

Raises Aircraft Wage Minimum

Washington — Labor Secretary Tobin last week established $1.05 an hr as the minimum wage required on government contracts by the aircraft manufacturing industry as defined under the Walsh-Healy Act. The new minimum is effective as of July 8 and supersedes the previous rate of 50¢ an hr held as the prevailing minimum in 1938.

FREE

PUBLICATIONS

Continued from Page 36

able to a drill press, boring mill, turret lathe, radial drill, or similar machines, and may be used in performing hundreds of operations. Other data sheets supply information on the company's E-Z set boring heads and precision grinders. *F. A. Maxwell Co.*

For free copy insert No. 8 on postcard, p. 37.

Hobbs Quality Gears

Barber-Colman's No. 16-16 hobbing machine is a consistent producer of high quality gears at high rates of production, as described in a new 16-p. illustrated catalog. The bulletin tells how this equipment offers a method for hobbing a wide variety of work, with quick, easy changeover from one job to another, with minimum maintenance and supervision. *Barber-Colman Co.*

For free copy insert No. 9 on postcard, p. 37.

Stamping Contractor

The experience, skill, versatility, facilities, quality and dependability of the company in making stamped parts, specialties and complete assemblies are outlined in a new 4-p. folder. These combined factors are available to manufacturers who use such items in steel, brass, aluminum, bronze, copper and zinc. *Indiana Pressed Steel Co.*

For free copy insert No. 10 on postcard, p. 37.

Power Screwdrivers

Detroit machines, made for constant service on production screwdriving, are described in a new 42-p. catalog. Advanced features of the equipment are shown, and sections of the book include information on fixtures, motorized hopper units, nut driving machines and special assembling machines. A number of detailed photos show adaptability of motorized hopper

Continued on Next Page

FREE PUBLICATIONS

Continued

units to various types of machines. *Detroit Power Screwdriver Co.*

For free copy insert No. 11 on postcard, p. 37.

Automatic Controls

Link-Belt automatic speed controls at critical points regulate the flow of material at the exact speed needed for maximum production, as detailed in a new 8-p. booklet. Electronic, hydraulic, pneumatic and mechanical basic control systems are shown, and a number of applications showing typical uses are cited. *Link-Belt Co.*

For free copy insert No. 12 on postcard, p. 37.

New Research Program

A graphic presentation of Sterling's new research and development program is contained in a new folder. The program is arranged to offer rapid, definite solutions to all your grinding problems, as detailed in the pamphlet. *Sterling Grinding Wheel Div., Cleveland Quarries Co.*

For free copy insert No. 13 on postcard, p. 37.

Engineers, Fabricators

Typical examples of industrial ovens, steel mill pulpits, mineral wool manufacturing equipment, and other special production equipment made by this company are described in a new illustrated folder. A list of industries served by Smith-designed ovens and allied units is also given. *James Campbell Smith, Inc.*

For free copy insert No. 14 on postcard, p. 37.

Single Surfacer

Features of the improved Crescent single surface wood planer are detailed in a new 4-p. folder. More production at less cost, quality work, with cabinet finish at speeds of 15 to 45 fpm, are some of the points discussed, and specifications for the P-18 are presented. *Power Tool Div., Rockwell Mfg. Co.*

For free copy insert No. 15 on postcard, p. 37.

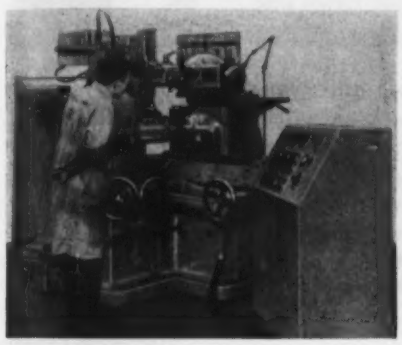
Resume Your Reading on Page 37

NEW

PRODUCTION IDEAS

Continued from Page 40

travel speeds and step feeds. The new units have a single shift and magnetic clutches driven by individual variable speed motors. Travel speeds are infinitely variable from 0.5 to 30 ipm. A single



unit mounted in the control cabinet gives range of feed from 0.010 to 4 in. in 0.010-in. increments. The new Keller BL automatically reverses vertical or horizontal travel motion at the edge of an irregular form or cavity, rather than at a fixed length of travel, thus eliminating non-cutting time. *Pratt & Whitney, Div. Niles-Bement-Pond Co.*

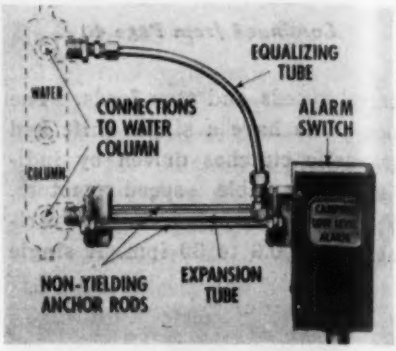
For more data insert No. 28 on postcard, p. 37.

Micro-Thermal Boiler Alarm

Variations of 5°F set off boiler alarm.

A super-sensitive device for boilers to sound an alarm when the water level reaches low consists of a ⅜ in. expansion tube with its inner end connected to the lower end of the water column on the boiler. Its outer end is connected to the upper part of the water column by means of 5/16 in. copper tubing. Therefore the water rises and lowers above the expansion tube. When the water level reaches its low level the increased heat in the tube expands and actuates a micro-switch connected to a buzzer,

bell, or howler. The sensitivity of the switch is a 0.001-in. pin throw. The mechanical advantage on the lever is ten, so the switch throws



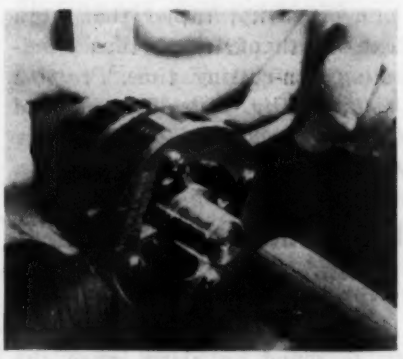
on an expansion of 0.0001 in. The switch will throw on and off on a temperature of only 5° F. The device can be attached to any boiler water column regardless of boiler size or length of column, by use of the flexible tube. *J. A. Campbell Co.*

For more data insert No. 29 on postcard, p. 37.

Pipe Threader

Cuts and threads Karbate pipe.

For use with Karbate impervious graphite pipe, a new hand threading tool makes it possible to cut, thread and install pipe right on the



job. The threader is said to produce clean, sharp threads. *National Carbon Div., Union Carbide & Carbon Corp.*

For more data insert No. 30 on postcard, p. 37.

Drill Press Adapter

Makes it possible to use the drills right down to the shank.

The air tube enters from the rear of the adapter, spirals at the base, and returns to the rear, throwing

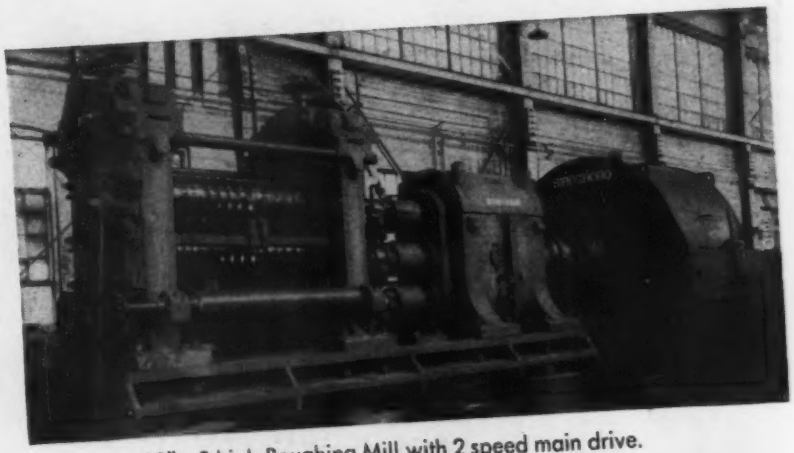
Continued on Page 130

From Design to Installation—

Birdsboro is well equipped to engineer, to your exact requirements, steel mill equipment that will contribute to your greater production—and profit.

BIRDSBORO
ROLLING MILL MACHINERY

Ballers & Balers, Scrap
Beds, Cooling
Beds, Inspection
Bumpers, Furnace
Calenders
Cars, Ingot, Billet, Ladle, etc.
Coilers & Reels
Conveyors, Coil
Drives & Pinions
Ejectors, Furnace
Gauges, Shear, Saw, etc.
Guides
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)
Lathes, Roll
Lathes, Slicing & Conditioning
Levelers, Plate
Machine, Flanging & Dishing
Manipulators, Mill, etc.
Mills, Blooming & Billet & Slabbing
Mills, Merchant & Bar
Mills, Plate
Mills, Rod
Mills, Sheet
Mills, Strip (Cold)
Mills, Strip (Hot) & Skelp
Mills, Vertical Edging
Mills, Ring
Planers, Plate
Pilers, Sheet & Plate
Pushers, Furnace
Repeaters
Rigs, Roll Changing
Saws
Shears, Alligator
Shears, Bloom, Billet, & Slab, Upcut, Downcut, Up-and-Downcut, Mechanical, & Hydraulic
Shears, Crop (Portable & Stationary)
Shears, Flying
Shears, Plate
Shears, Trimming and Slitting
Straighteners, Gag, Tables & Manipulators
Straighteners, Rotary
Stripping Machines, Ingot
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Testing Machines, Pipe
Transfers



18"—3 high Roughing Mill with 2 speed main drive.

Six Stand 10" Rod Finishing Mill.

Flying Shear for high speed parting of merchant bars.

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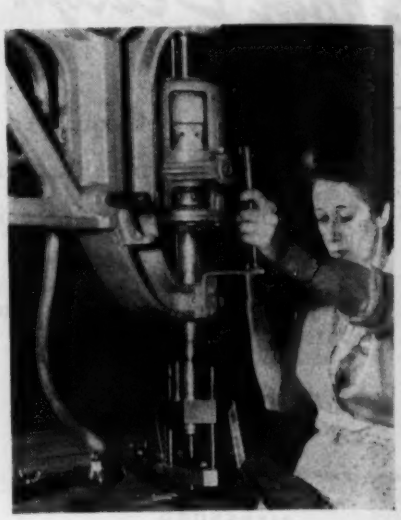
DESIGNERS and BUILDERS OF: Steel Mill Machinery • Hydraulic Presses • Rolls • Special Machinery • Steel Castings • Crushing Machinery



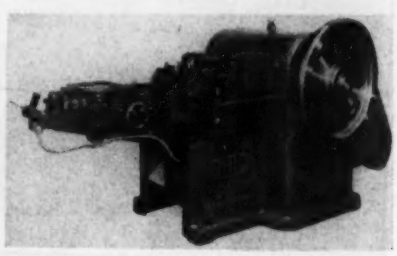
the chips out in that direction. The drill can be changed without removing the adapter. A Plexiglas shield provides the operator with a clear, unobstructed view of the operation. *Glenn L. Martin Co.*

For more data insert No. 31 on postcard, p. 37.

Redesigned Nail Machines

Adjustable feeder linkage allows nail length changes.

Claimed to be the only machine that incorporates an adjustable-fulcrum feeder linkage, Black nail machines permit change in nail length while machine is operating. Other features are the two-plane wire



straightener, automatic cutoff dies, and adjustable header tool that produces nail heads of different diameters and thicknesses. Machines are of heavy duty steel construction and are available in a wide variety of sizes from small brad producing models to one for making ⅜x12-in. spikes. *Black Nail Machine Div., Ohio Electric Mfg. Co.*

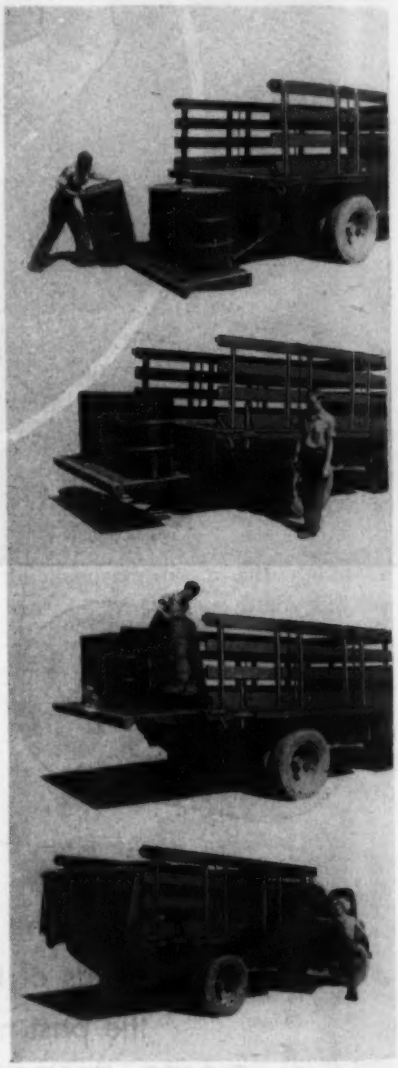
For more data insert No. 32 on postcard, p. 37.

Continued on Page 132

Lift End Gate

Permits one-man operation for trucks hauling heavy, bulky cargo.

Known as the Covey Hydra-Power End Gate, it can be installed on any make or model truck with suitable body type, and is operated from the truck power take-off. Lifting and closing of the gate is



accomplished by hydraulic power, with only one hydraulic cylinder used for all operations connected with the lowering, raising, and closing of the gate. The gate is steel and wood construction with a load capacity of 3000 lb. *Perfection Steel Body Co.*

For more data insert No. 33 on postcard, p. 37.

Continued on Page 134

Materials Handling Boxes

Corrugated steel bulk material boxes stack in 75 pct less space.

Collapsible, 2000-lb capacity materials handling boxes can be erected in less than 20 sec and stacked in 25 pct of the space taken by erected storage boxes. Folder height is 9 1/16 in. When erected,

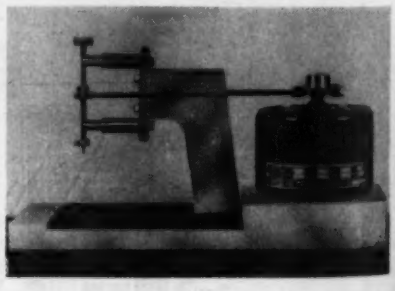
these bulk material boxes stand 28⅛ in. high with a 49x37x24-in. interior. Fork trucks can enter from all four sides. Corrugated heavy gage steel assures maximum rigidity at minimum weight. Boxes are of all welded construction, with smooth rolled edges as a safety feature. *Phillips Mine & Mill Supply Co.*

For more data insert No. 34 on postcard, p. 37.

Micro Drilling Machine

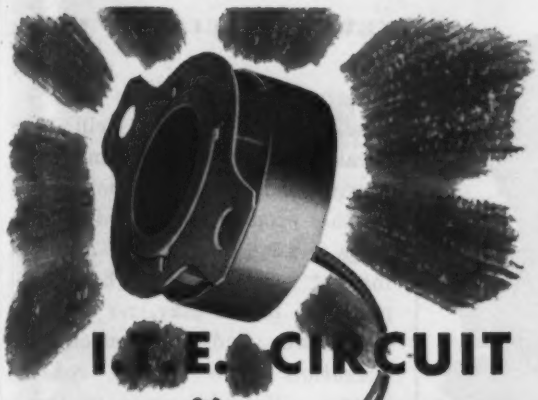
Unit mass produces precision holes without drill breakage.

Holes as small as 0.0016 in. in diam can be produced at high pro-



duction rates and yet with the necessary precision on new precision drilling machine. The machine features extreme simplicity of design and claims the elimination of the

Continued on Page 136



Udylite JUNIOR AUTOMATIC

gives increased production... more uniform plating for I.T.E. CIRCUIT BREAKER COMPANY

This Udylite Junior Automatic Plating Machine cleans and plates television receiver parts for I.T.E. Circuit Breaker Company. Uniform finish is essential to precision parts like this.

THE plating department of I.T.E. Circuit Breaker Company, Philadelphia, reports splendid performance by their Udylite Junior Automatic plating machine. Used primarily for finishing television receiver components—this Udylite unit incorporates BOTH cleaning and plating in ONE operation. The results are: greater quantity and improved quality of production with lower direct labor costs.

This is typical of the results gained by Udylite customers. In virtually every case they report that Udylite plating equipment and processes give them both cost reduction and increased quality of plating. You can reap these same rewards with Udylite. Call in your Udylite Technical Man and let him analyze your operation and make recommendations for bigger plating profits for you. Or write direct to the Udylite Corporation, Detroit 11, Michigan. There's no obligation.

THE **Udylite** CORPORATION
DETROIT 11, MICHIGAN

slow speed and high drill point breakage faults of the cumbersome conventional machines being used in the production of micro inch holes. The unit has only one moving part, the spindle. There is reputed to be no play, no wear, no lost motion, and no vibration in its operation. The spindle runs in bronze oilless bearings of the V type and is held in alignment without the need of adjustments by the endless rubber drive belt. Whatever wear might develop between the spindle and the bearings is automatically taken up by the pull of the belt. The upward pulling force of the belt drive avoids drill point breakage normally caused by the tendency of the drill point to hog down into the work when breaking through the hold. *Walcon Engineering Co.*

For more data insert No. 35 on postcard, p. 37.

Induction Heater

Heats 1-in. steel rods 1500°F in approx 3 sec.

This portable high frequency induction heating unit also brazes carbide tips to cutting tools up to 1½ in. sq and will melt 4 oz of steel or brass in 4 min. The unit is suitable for hardening, annealing, normalizing and soldering ferrous and nonferrous metals. It is used on 110 v 60 or 50 cycle line current. Heating cycles can be preset for desired temperatures with automatic timer and operated by push-button or foot switch. *Lepel High Frequency Laboratories, Inc.*

For more data insert No. 36 on postcard, p. 37.

Resume Your Reading on Page 41

Briefs and Bulletins

copper import tax—Suspension of the import tax on copper until July 1, 1951 was voted by the House this week. Despite protests of mining-state congressmen, the House voted 283-58, far more than the two-thirds majority needed to suspend the tariff retroactively for one year beginning July 1, 1950. The bill now goes to the Senate, where the tax-writing Finance Committee has promised early consideration. Simon D. Strauss, American Smelting & Refining Co., told the House that the Far East crisis was almost certain to increase copper demand and that it would be "shortsighted" to levy the $40 per ton tariff on an essential defense material.

stainless rise—Eastern Stainless Steel Corp., Baltimore, prices on all stainless steel products, excepting plates, were raised. Base prices of all stainless grades, gages and finishes other than the special Hundred Grit were advanced 1.5c a pound. Hundred Grit, all grades and gages, went up 2.5c per lb. Washington Steel Co. upped prices of its cold rolled sheets and strip by 1.5c per lb. Jessop Steel Co. moved rerolling billets, blooms, slaps and tube rounds up by 1c and all other products, 1.5c. Plates and castings stayed unchanged.

dolomite refractories — Basic Refractories, Inc., Cleveland, advanced the price of dead burned dolomite refractories, Magnefer and Syndolag, by 75c, effective July 1. It brought its price to $13.00 per net ton f.o.b. Basic plants at Narlo and Bettsville, Ohio, for bulk carload shipments. Price for shipment of either dead burned dolomite product in multiwall bags is $17.50 per net ton f.o.b. the plants.

dryer drop—A 16 pct reduction in the retail price of its electric clothes dryer, from $239.50 to $199.50, effective immediately, was announced by the Thor Corp. M. R. Wilson, general sales manager, credited the drop to production savings and foresaw an increase of 133 pct over 1949 sales volume in the industry's sales.

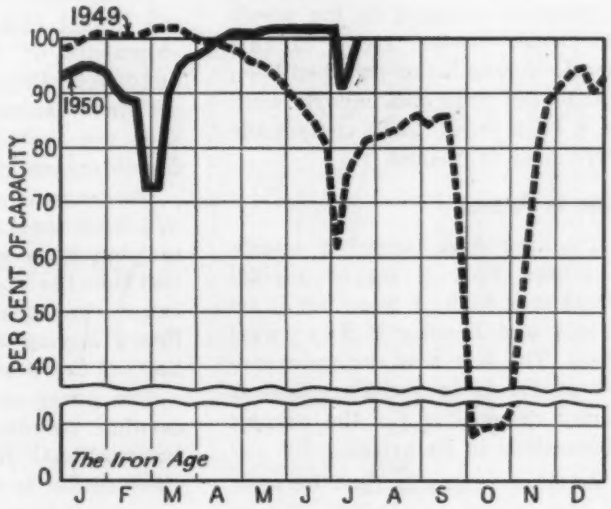
structural shapes — Its price on structural steel shapes was raised from 3.30c per lb to 3.45c per lb f.o.b. Phoenixville, Pa., by the Phoenix Iron & Steel Co.

magnesium wrought rise—Citing increased production costs as reason for the increase, Dow Chemical Co., Midland, Mich., announced that commercial grade Dowmetal FS extrusions were advanced 2c per lb and commercial grade Dowmetal M was increased to equal the new FS extrusion prices. Dow raised commercial grade and FS sheet by 4c per lb in mill standard and nonstandard sizes and in all gages from 0.032 in. and heavier. Specification grade M and FS1 sheet in the same sizes and gages went up 6c.

alloy sold out —Alloy steel order books are filled through the third quarter and into the fourth. One large alloy steel producer is as good as sold out for the balance of the year. He knows the business is there; he lacks only the specifications from his customers.

big year—Stainless steel producers are heading for their greatest year in history. One company has told its stockholders that stainless sales for the year will amount to 210 million lb. The previous high was 1948 when their sales totaled about 152 million lb.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
July 9	100.0	99.5*	94.0	88.0	54.5	104.0	104.0	104.0	108.0*	99.4*	88.0	84.4	44.0	96.5
July 16	101.0	99.0	92.0	88.0	100.0	104.0	102.5	104.0	107.0	106.0	84.0	83.5	97.0	100.0

* Revised.

Nonferrous Metals OUTLOOK

Market Activities

Tin price soars to new high for the year . . . Lead increases catch many buyers short . . . Munitions Board stockpiling in lead not increased—yet . . . Alimport argues tariff.

by JOHN ANTHONY

New York — The wait-and-see attitude of metals buyers immediately following the outbreak of hostilities in Korea has given way to a buying wave that has driven up the prices of tin and lead.

Meanwhile, though the prices remain unchanged, the markets for zinc and copper remain strong.

With many buyers in short positions, last week's price jumps in lead, which totaled 1¢ per lb, took many by surprise since it was a complete reversal in the previous weak market trend of this metal. Stockpiles of lead had been considered good and imports were on a high level. Lead compounds were also increased.

War Is Reason

Tin had been showing steady increases, then it surged rapidly ahead to a high of 96.5¢ per lb on Friday and Monday it dropped again. The fact that the main supply of tin is in the Far East is partly responsible for the current fluctuations in its price.

Another reason is that, because of the feared possibility of war shortages, many consumers are attempting to increase their inventories of tin as well as lead. Thus far the Munitions Board is the exception. It states definitely that it has not increased its stockpile buying of nonferrous metals except for copper, and it also states that the increase in copper stockpiling was not caused by the war in Korea.

Prevent Nickel Hoarding?

Producers' stocks of copper at the lowest ebb since 1944, while shipments of refined copper in June were 126,047 tons, the highest since January 1947. This total does not include copper shipped for Government stockpiles.

Government purchasing of lead had been tapering off to some extent but many sources in the trade feel that the Korean situation will cause the renewal of Munitions Board buying during the second half of the year.

The guess in Washington concerning voluntary allocations by International Nickel Co. is that, since nickel is a short commodity anyway, this method is being used to keep buyers from hoarding and causing even bigger shortages. A Munitions Board spokesman told THE IRON AGE that voluntary allocations of nickel did not result from any change in stockpile buying.

An international agreement on tin prices and trade is now in the offing. The United Nations Secretary General has been authorized to call conferences for the purpose of forming such commodity agreements, and a tin conference is practically assured.

A recommendation that agreement of producers and consumers to regulate production prices and trade in tin should be negotiated had already been made by the International Tin Study Group.

Alimport Answers

In answer to the recent charges and application of Reynolds Metals Co. and Kaiser Aluminum & Chemical Corp. for increased tariffs on imported aluminum, the Aluminum Import Corp. has prepared a 20-page brief defending itself and protesting the proposals.

Aluminum Import makes these claims in the brief: (1) The Aluminum Co. of Canada has not received any subsidy, (2) Alcan is not under common control with Alcoa, (3) the Canadian industry has neither manipulated the U. S. market nor indulged in unfair or disruptive competition.

NONFERROUS METALS PRICES

	July 12	July 13	July 14	July 15	July 17	July 18
Copper, electro, Conn.	22.50	22.50	22.50	22.50	22.50	22.50
Copper, Lake, Conn.	22.625	22.625	22.625	22.625	22.625	22.625
Tin Straits, New York	87.25	92.00	96.50	....	92.00	92.50*
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	11.30	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.
*Tentative.

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 27.4¢; 4S, 61S-O, 29.3¢; 52S, 31.4¢; 24S-O, 24S-OAL, 30.3¢; 75S-O, 75S-OAL, 36.8¢; 0.081 in., 2S, 3S, 28.4¢; 4S, 61S-O, 30.7¢; 52S, 32.8¢; 24S-O, 24S-OAL, 31.4¢; 75S-O, 75S-OAL, 38.5¢; 0.032 in., 2S, 3S, 30.0¢ 4S, 61S-O, 34.0¢; 52S 36.7¢ 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 48-1¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 24.8¢ 4S-F, 27¢; 52S-F, 28.1¢; 61S-O, 27.6¢; 24S-F, 24S-FAL, 28.1¢; 75S-F, 75S-FAL, 34.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 67¢; 11 to 13, 34.3¢ to 79¢; 23 to 25, 36.3¢ to $1.08; 35 to 37, 43.3¢ to $1.66.

Rod Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34.5¢ to 31¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 37¢ to 32.5¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4, ⅛ to 11/32 in., 49.5¢ to 38.5¢; ⅜ to 1½ in., 38¢ to 36¢; 1 9/16 to 3 in., 36¢ to 33¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36.5¢ to 27¢; 52S, 44.5¢ to 32.5¢; 56S, 47.5¢ to 39¢; 17S-T4, 50.5¢ to 35¢; 61S-T4, 45¢ to 34.5¢; 75S-T-6, 76.5¢ to 55.5¢.

Extruded Tubing, Rounds: 63S-T5; OD in in.: 1¼ to 2, 33.5¢ to 49¢; 2 to 4, 30.5¢ to 41.3¢; 4 to 6, 31¢ to 37.8¢; 6 to 9, 31.5¢ to 39.3¢.

Roofing Sheet, Flat: 0.019 in. x 28 in, per sheet, 72 in., $1.008; 96 in., $1.344; 120 in., $1.679; 144 in., $2.017. Gage 0.024 in. x 28 in., 72 in., $1.224; 96 in., $1.633; 120 in., $2.042; 144 in., $2.451. **Coiled Sheet:** 0.019 in. x 28 in., 24.7¢ per lb; 0.024 in. x 28 in., 23.7¢ per lb.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: M-O, FS-O, ¼ in., 58¢ to 60¢; 0.0188 in., 60¢ to 62¢; B&S gage ⅛, 62¢ to 64¢; 10, 63¢ to 65¢; 12, 67¢ to 69¢; 14, 73¢ to 78¢; 16, 80¢ to 85¢; 18, 88¢ to 93¢; 20, $1.00 to $1.05; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, FS, diam in., ¼ in. to 0.311, 66¢; ½ in. to ¾, 50¢; 1¼ to 1.749, 47¢; 2½ to 5 in., 45¢. Other alloys higher. Base: Up to ¾ in., diam, 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, FS, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 59.5¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 55¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 50.5¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 47.5¢ 4 to 6 lb per ft, per. up to 28 in. 46.5¢. Other alloys higher. Base, in weight per ft of shape; Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, FS, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	69	53
Strip, cold-rolled	75	56
Rods and bars	65	61
Angles, hot-rolled	65	61
Plates	67	62
Seamless tubes	98	86
Shot and blocks	..	46

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	37.43	....	37.03
Copper, h-r	....	33.28	....
Copper, drawn		34.53	....
Low brass	35.52	35.21	....
Yellow brass	34.19	33.88	....
Red brass	35.96	35.65	....
Naval brass	38.90	32.96	34.22
Leaded brass	....	28.54	32.65
Com'l bronze	36.93	36.62	....
Manganese bronze	42.40	36.27	37.85
Phosphor bronze	55.11	55.36	....
Muntz metal	37.13	32.69	34.94
Everdur, Herculoy, Olympic, etc.	42.05	40.99	....
Nickel silver 10 pct	45.48	47.74	....
Arch. bronze	....	....	32.65

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	17.50
Aluminum pig	16.50
Antimony, American, Laredo, Tex.	24.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$30.00
Beryllium aluminum 5% Be, dollars per lb contained Be	$56.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.15
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	22.50
Copper, Lake, Conn. Valley	22.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	21.50
Magnesium, sticks, 100 to 500 lb	37.50¢ to 39.50¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $71
Nickel, electro, f.o.b. New York	51.22
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	44.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$74 to $77
Silver, New York, cents per oz.	72.75
Tin, New York	92.50
Zinc, East St. Louis	15.00
Zinc, New York	15.72
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	21.75-22.00
No. 120	21.25-21.50
No. 123	20.75-21.00
80-10-10 ingot	
No. 305	25.50
No. 315	23.50
88-10-2 ingot	
No. 210	31.50
No. 215	29.00
No. 245	23.75-24.75
Yellow ingot	
No. 405	18.25-19.00
Manganese bronze	
No. 421	23.50

Aluminum Ingot

(Cents per lb, of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.00-20.25
0.60 copper, max.	19.75-20.25
Piston alloys (No. 122 type)	18.50-19.00
No. 12 alum. (No. 2 grade)	17.75-18.25
108 alloy	18.50-19.00
195 alloy	19.50-20.00
13 alloy	20.00-20.25
AXS-679	18.50-19.00
Steel deoxidizing aluminum, notch-bar granulated or shot	
Grade 1—95-97½%	19.25-19.50
Grade 2—92-95%	18.25-18.50
Grade 3—90-92%	17.25-17.50
Grade 4—85-90%	16.75-17.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39½
Electrodeposited	33⅜
Rolled, oval, straight, delivered	36.59
Forged ball anodes	41
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	23
Ball anodes	22
Nickel 99 pct plus	
Cast	68.00
Rolled, depolarized	69.00
Cadmium	$2.30
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	52.15
Copper sulfate, 99.5 crystals, bbl.	10¾
Nickel salts, single or double, 4-100 lb bags, frt allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drums	45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	19½	18¾
Yellow brass	16¾	16
Red brass	18⅛	17⅜
Commercial bronze	18⅜	17⅝
Manganese bronze	16⅛	15⅜
Leaded brass rod ends	16½	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25-19.50
No. 2 copper wire	18.25-18.50
Light copper	17.25-17.50
Refinery brass	17.75-18.00*
Radiators	13.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	19.25
No. 2 copper wire	18.25
Light copper	17.25
No. 1 composition	15.50-16.00
No. 1 comp turnings	15.00-15.50
Rolled brass	13.50
Brass pipe	15.00
Radiators	13.00-13.25
Heavy yellow brass	11.75-12.00
Aluminum	
Mixed old cast	10.00-10.25
Mixed old clips	10.75-11.00
Mixed turnings, dry	10.00-10.25
Pots and pans	10.00-10.25
Low copper	11.75-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	16¾—17
No. 2 heavy copper and wire	15¾—16
Light copper	14¾—15
Auto radiators (unsweated)	11¼—11½
No. 1 composition	14 —14¼
No. 1 composition turnings	13½—13¾
Clean red car boxes	12¾—13
Cocks and faucets	12¾—13
Mixed heavy yellow brass	9½— 9¾
Old rolled brass	10½—10¾
Brass pipe	12½—12¾
New soft brass clippings	14¼—14½
Brass rod ends	12¼—12½
No. 1 brass rod turnings	12 —12¼
Aluminum	
Alum. pistons and struts	6 — 6½
Aluminum crankcases	8½— 9
2S aluminum clippings	11½—12
Old sheet and utensils	8½— 9
Borings and turnings	5½
Misc. cast aluminum	8½— 9
Dural clips (24S)	8½— 9
Zinc	
New zinc clippings	10 —10¼
Old zinc	7¾— 8
Zinc routings	5¼— 5½
Old die cast scrap	5½— 5¾
Nickel and Monel	
Pure nickel clippings	36 —39
Clean nickel turnings	32 —35
Nickel anodes	36 —39
Nickel rod ends	36 —39
New Monel clippings	15 —19
Clean Monel turnings	10 —14
Old sheet Monel	14 —18
Inconel clippings	22 —26
Nickel silver clippings, mixed	9 —10
Nickel silver turnings, mixed	6 — 7
Lead	
Soft scrap, lead	9¾—10
Battery plates (dry)	5 — 5¼
Magnesium	
Segregated solids	9 —10
Castings	5½— 6½
Miscellaneous	
Block tin	65 —67
No. 1 pewter	43 —45
No. 1 auto babbitt	40 —42
Mixed common babbitt	9¾—10
Solder joints	13 —13½
Siphon tops	38 —40
Small foundry type	13 —13½
Monotype	12 —12½
Lino. and stereotype	11 —11½
Electrotype	9¾—10
New type shell cuttings	15 —15¼
Hand picked type shells	6 — 6½
Lino. and stereo. dross	4¼— 4¾
Electro. dross	2¾— 3

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Today's Worry: Price Controls, Allocation

Early this week the various markets around the nation showed no correlation other than worrying about possible government price fixing and allocations. Most guesses as to where scrap prices would be pegged, if such a move were made, were considerably lower than current quotations.

Some mills are staying out of the market hoping that this might drive prices lower for possible fixing. Others are of the opinion that if prices are allowed to drop too far, many necessary scrap sources will dry up for lack of profits.

The undertone in many markets this week was one of increased firmness. No. 1 steel showed few changes in the main markets, while No. 2 was increased in some. Other markets dropped slightly in these grades.

Summer vacations and hot weather are continuing to be retarding factors but the main trend throughout the country is a wait-and-see attitude toward the war in Korea and its effects in this country.

PITTSBURGH—The market was showing signs of firmness. Brokers were still busy filling old orders, but there were indications that this heavy backlog will be cleared up soon. Several mills which had held up shipments have given their suppliers the go-ahead sign. No. 2 heavy melting was $1.00 stronger, as were machine shop turnings and heavy turnings. Railroad specialties were up 50¢ on the high side.

CHICAGO—There is a firm undertone prevailing in the Chicago area scrap market this week. Industrial scrap is bringing better prices. Some dealers report offerings of $37.00 per gross ton for No. 1 heavy melting steel by brokers. Most quarters feel the market will remain fairly steady with some predicting a slight upward trend. Plant shutdowns during the vacation season are cutting down the supply of scrap.

PHILADELPHIA—Most prices are holding steady in the scrap market here, with new buying in small quantities. All grades stayed at last week's level except short rails, up 50¢; mixed yard cast, up $1.00 on new buying. Worry over possible allocations and price controls for scrap has caused some unsettlement.

NEW YORK—Following a very quiet week, steelmaking scrap showed stronger trends early this week although the prices remained unchanged. The mills are coming back into the market. The Korean question has caused an unsettled feeling here and everyone is worried about the possibility of price controls. Guessing on the level of these, if imposed, ranges all over the lot. Turnings and borings prices were up slightly but others remained constant.

DETROIT—The market is marking time as a mounting crop of rumors has it that allocations or price controls may be imposed in the industry as a result of developments in the Korean situation and elsewhere on the international front. One theory is that by staying out of the market, steel mills hope to see scrap prices frozen at lower levels than might otherwise be the case. The opposing argument has it that if prices are allowed to sink too low, scrap sources that may be highly necessary will dry up for lack of proper profit incentive. No price changes are being made this week in the absence of actual sales and in the face of a market that could jump in either direction.

CLEVELAND—Mills are moving warily here as the possibility of price controls loomed. Best guess at the moment is that if controls are put on scrap No. 1 heavy melting will be pegged at about $35.00. Also as a result of the war scare, resistance of some of the dealers to present prices has been stiffening. Others are shipping everything they own. Brokers have no big orders and thus owe little tonnage which leaves them in position to move on the small orders, 1000 tons or so. Reports of a sale of No. 1 heavy melting in Cleveland at $40 were unconfirmed at press time.

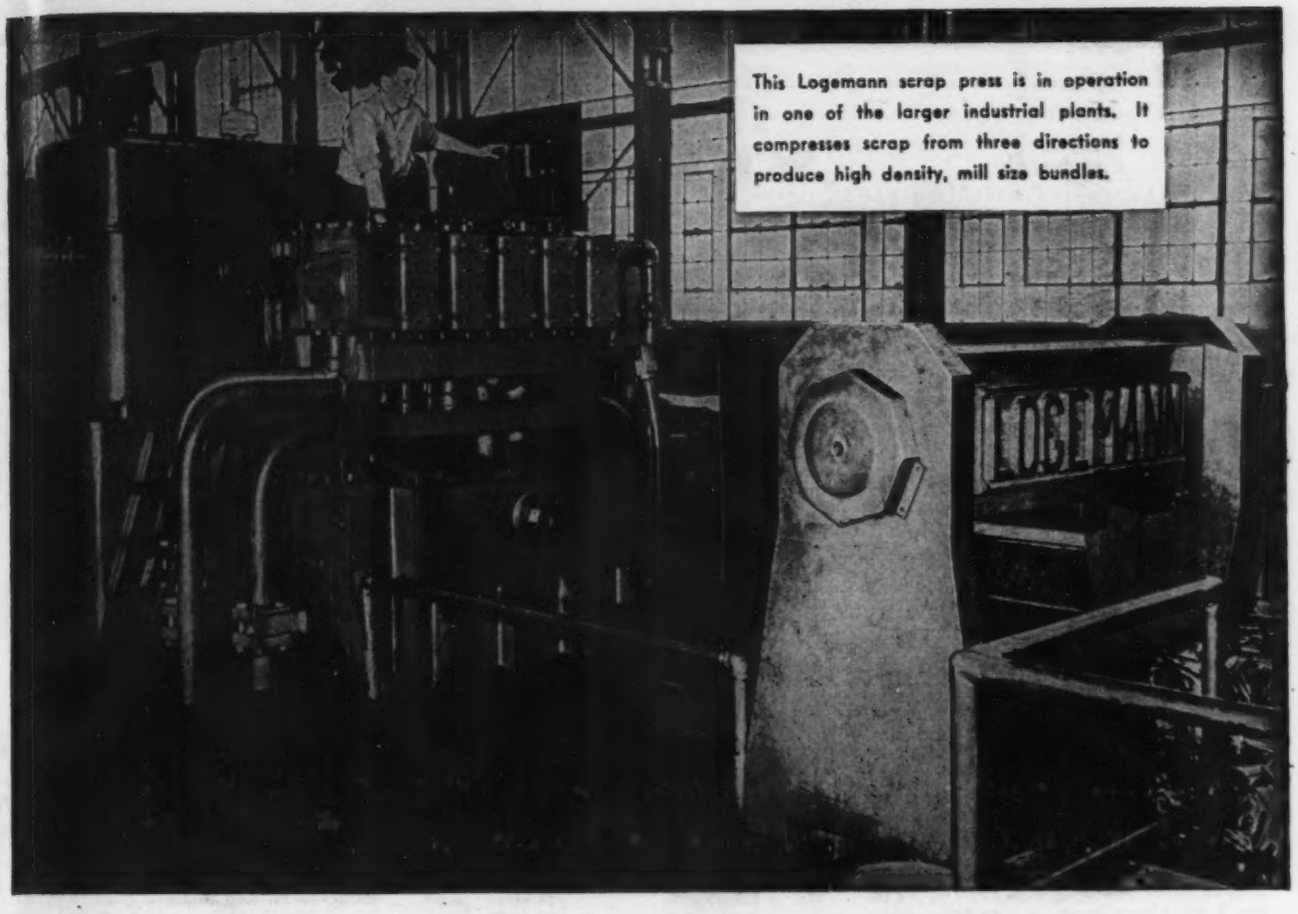
ST. LOUIS—The Korean war has resulted in a cautious attitude by the steel mills here. There was no buying during the week, as the mills were uncertain as to whether controls may come with price cutbacks. The mills are said to have an average supply of scrap for 90 day's consumption. Shipments to the market are tapering off, with hot weather being one of the reasons. Stove plate was off $1.00 per ton; other prices were unchanged.

CINCINNATI—A firmer undertone marked a quiet market here this week. The possibility of controls has spurred the more bearish spirits to step up shipments but the bulls are hanging on for a possible August upturn. No. 1 heavy melting steel is quotable here this week at $36.00, based on broker buying prices. Foundry grades continue to show strength. A major railroad will open bids on 9000 tons here this week, according to reports.

BOSTON—Prices on openhearth grades of scrap have shown a tendency to slip still more as business continues to fall off. The summer vacation season has started and many of the men connected with the industry are temporarily gone. No. 1 heavy melting steel was down 50¢ a ton as were No. 1 bundles, and No. 2 heavy was off $1.50.

BIRMINGHAM—As predicted by brokers the early part of this month, scrap prices here registered a slight decline in some categories this week, while others remained steady. Brokers say prices went too high last month and when buyers got what they needed they stopped buying. But the high prices brought in a flood of scrap to dealers and they are shaving prices to work off some of the surplus.

BUFFALO—According to dealers, the sale last week of about 25,000 tons of steelmaking scrap at prices $2.00 a ton below the prevailing range was prompted by apprehension over probable price controls which would peg scrap at even lower levels. Three of the area's top dealers shared in this transaction with a leading mill consumer which placed No. 1 heavy melting at $36.50 to $37.00.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-Contained . . . .
Triple Compression . .
Automatically Controlled

LOGEMANN SCRAP PRESSES

handle high tonnages with minimum labor . . . *at low cost*

The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information — please state the nature of your scrap and tonnage.

LOGEMANN METAL BALERS

. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street • Milwaukee 10, Wisconsin

Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$41.50 to $42.00
No. 2 hvy. melting	34.50 to 35.00
No. 1 bundles	41.50 to 42.00
No. 2 bundles	33.50 to 34.00
Machine shop turn.	28.50 to 29.00
Mixed bor. and ms. turns.	28.50 to 29.00
Shoveling turnings	33.50 to 34.00
Cast iron borings	32.50 to 33.00
Low phos. plate	44.50 to 45.00
Heavy turnings	39.50 to 40.00
No. 1 RR. hvy. melting	43.00 to 43.50
Scrap rails, random lgth.	43.50 to 44.00
Rails 2 ft and under	46.00 to 47.00
RR. steel wheels	45.50 to 46.50
RR. spring steel	45.50 to 46.50
RR. couplers and knuckles	45.50 to 46.50
No. 1 machinery cast	43.50 to 44.00
Mixed yard cast.	38.00 to 38.50
Heavy breakable cast.	33.50 to 34.00
Malleable	43.00 to 44.00

Chicago

No. 1 hvy. melting	$37.00 to $37.50
No. 2 hvy. melting	35.00 to 35.50
No. 1 factory bundles	37.00 to 37.50
No. 1 dealers' bundles	37.00 to 37.50
No. 2 dealers' bundles	29.00 to 30.00
Machine shop turn.	24.50 to 25.50
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	42.50 to 43.50
Low phos. plate	40.50 to 41.50
No. 1 RR. hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	47.00 to 48.00
Rails 2 ft and under	47.50 to 48.50
Locomotive tires, cut	44.00 to 45.00
Cut bolsters & side frames	41.00 to 42.00
Angles and splice bars	45.00 to 46.00
RR. steel car axles	57.00 to 58.00
RR. couplers and knuckles	43.50 to 44.50
No. 1 machinery cast.	45.00 to 46.00
No. 1 agricul. cast.	43.00 to 44.00
Heavy breakable cast.	37.00 to 38.00
RR. grate bars	36.00 to 37.00
Cast iron brake shoes	36.00 to 37.00
Cast iron car wheels	41.50 to 42.50
Malleable	47.00 to 48.00

Philadelphia

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	32.00 to 33.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Low phos. punchings, plate	36.00 to 37.00
Low phos. 5 ft and under	36.00 to 37.00
Low phos. bundles	33.00 to 34.00
Hvy. axle forge turn.	32.00 to 33.00
Clean cast chem. borings	33.00 to 34.00
RR. steel wheels	38.00 to 39.00
RR. spring steel	38.00 to 39.00
Rails 18 in. and under	41.50 to 42.50
No. 1 machinery cast	38.00 to 39.00
Mixed yard cast	33.00 to 34.00
Heavy breakable cast	34.00 to 35.00
Cast iron carwheels	39.00 to 40.00
Malleable	41.00 to 42.00

Cleveland

No. 1 hvy. melting	$38.00 to $38.50
No. 2 hvy. melting	33.00 to 33.50
No. 1 busheling	38.00 to 38.50
No. 1 bundles	39.50 to 40.00
No. 2 bundles	28.00 to 28.50
Machine shop turn.	24.00 to 24.50
Mixed bor. and turn.	27.00 to 27.50
Shoveling turnings	27.00 to 27.50
Cast iron borings	27.00 to 27.50
Low phos. 2 ft and under	40.00 to 40.50
Steel axle turn.	38.00 to 38.50
Drop forge flashings	38.00 to 38.50
No. 1 RR. hvy. melting	43.00 to 43.50
Rails 3 ft and under	48.00 to 49.00
Rails 18 in. and under	49.00 to 50.00
No. 1 machinery cast.	46.00 to 47.00
RR. cast.	46.00 to 47.00
RR. grate bars	34.00 to 35.00
Stove plate	38.00 to 39.00
Malleable	47.00 to 48.00

Youngstown

No. 1 hvy. melting	$40.50 to $41.00
No. 2 hvy. melting	35.50 to 36.00
No. 1 bundles	40.50 to 41.00
No. 2 bundles	$32.50 to $33.00
Machine shop turn.	19.50 to 20.50
Mixed bor. and turn.	19.50 to 20.50
Shoveling turnings	22.00 to 23.00
No. 1 busheling	28.00 to 29.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast.	31.00 to 32.00
No. 2 machinery cast	30.00 to 31.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	25.00 to 26.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 bundles	35.50 to 36.50
New busheling	33.50 to 34.50
Flashings	30.00 to 31.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. plate	33.50 to 34.50
No. 1 cupola cast.	38.00 to 40.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	33.00 to 34.00
Automotive cast.	42.00 to 43.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$35.50 to $36.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	35.50 to 36.00
No. 2 bundles, black	26.50 to 27.00
No. 2 bundles, mixed	25.50 to 26.00
Machine shop turn.	20.50 to 21.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Low phos. 18 in. under	46.00 to 47.00
Rails, random lengths	41.50 to 42.00
Rails, 18 in. and under	49.00 to 50.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	35.50 to 36.00
Drop broken cast.	48.00 to 49.00

San Francisco

F.o.b. shipping point:

No. 1 hvy. melting	$22.00
No. 2 hvy melting	20.00
No. 1 bundles	22.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	22.00
Scrap rails, random lgth.	22.00
No. 1 cupola cast.	$32.50 to 34.00

Los Angeles

F.o.b. shipping point:

No. 1 hvy. melting	$22.00
No. 2 hvy. melting	20.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	9.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	22.00
No. 1 cupola cast.	$37.50 to 40.50

Seattle

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	20.00
No. 1 bundles	18.00
No. 2 bundles	18.00
No. 3 bundles	14.00
Elec. fur. 1 ft and under	$29.00 to 30.00
RR. hvy. melting	21.00
No. 1 cupola cast	35.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed steel scrap	26.00
Mixed bor. and turn.	23.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bush., new fact, prep'd.	29.00
Bush., new fact, unprep'd.	23.00
Short steel turnings	23.00
Cast scrap	40.00

Buffalo

No. 1 hvy. melting	$36.50 to $37.00
No. 2 hvy. melting	33.00 to 33.50
No. 1 busheling	33.00 to 33.50
No. 1 bundles	34.00 to 34.50
No. 2 bundles	31.00 to 31.50
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	28.00 to 29.00
Low phos. plate	38.50 to 39.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	45.00 to 47.00
RR. steel wheels	42.00 to 43.00
RR. spring steel	42.00 to 43.00
RR. couplers and knuckles	42.00 to 43.00
No. 1 machinery cast.	38.00 to 39.00
No. 1 cupola cast.	35.00 to 36.00
Small Indus. malleable	37.00 to 38.00

Birmingham

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	37.00 to 38.00
Structural and plate	36.00 to 37.00
Scrap rails, random lgth.	35.00 to 36.00
Rerolling rails	43.00 to 44.00
Rails 2 ft and under	42.50 to 43.50
Angles & splice bars	40.00 to 41.00
Std. steel axles	34.00 to 35.00
No. 1 cupola cast.	38.00 to 39.00
Stove plate	32.50 to 33.50
Cast iron carwheels	33.00 to 34.00

St. Louis

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	32.00 to 33.00
No. 2 bundled sheets	31.00 to 32.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	22.00 to 23.00
Rails, random lengths	39.00 to 40.00
Rails 3 ft and under	45.00 to 46.00
Locomotive tires, uncut	39.00 to 40.00
Angles and splice bars	43.00 to 44.00
Std. steel car axles	52.00 to 53.00
RR. spring steel	41.00 to 42.00
No. 1 machinery cast.	39.00 to 40.00
Hvy. breakable cast.	34.00 to 35.00
Cast iron brake shoes	36.00 to 38.00
Stove plate	33.00 to 34.00
Cast iron car wheels	39.00 to 40.00
Malleable	44.00 to 45.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.50 to $31.00
No. 2 hvy. melting	26.50 to 27.00
No. 2 bundles	24.50 to 25.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.50 to 21.50
Clean cast chem. bor.	28.00 to 29.00
No. 1 machinery cast.	31.00 to 32.00
Mixed yard cast.	29.00 to 29.50
Charging box cast.	29.00 to 29.50
Heavy breakable cast.	29.50 to 30.00
Unstrp. motor blocks	22.00 to 22.50

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $28.50
No. 2 hvy. melting	22.50 to 23.00
No. 1 bundles	28.00 to 28.50

cut structural and plate scrap*

use:

By electric furnaces and steel foundries for making various types of steel and castings. Up to 100% charge of scrap can be used depending on type of steel being made.

source:

Scrap from plates, structural shapes, crop ends, shearings, broken steel tires and like material.

This is one of a series illustrating the various types of scrap used in making iron and steel. We supply this scrap as well as all other grades of iron and steel scrap. Call on our well trained and experienced organization to solve your scrap problem.

**Clean open hearth steel plates, structural shapes, crop ends, shearings or broken steel tires. Must be not less than ¼ inch in thickness, not over 3 feet in length and 18 inches in width. Must not contain over .05% phosphorus or sulphur. (Also comes in two other classifications—2 feet and under, and 1 foot and under.) OPA Specification.*

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

PLANTS

LEBANON, PENNA.
READING, PENNA.
DETROIT (ECORSE), MICHIGAN
MODENA, PENNA.
PITTSBURGH, PENNA.
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MAIN OFFICE

LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

OFFICES

BIRMINGHAM, ALA. Empire Building	CHICAGO, ILLINOIS 100 W. Monroe St.	HOUSTON, TEXAS 1114 Texas Av. Bldg.	PITTSBURGH, PA. Oliver Building
BOSTON, MASS. Statler Building	CLEVELAND, OHIO 1022 Midland Bldg.	LEBANON, PENNA. Luria Building	PUEBLO, COLORADO 334 Colorado Bldg.
BUFFALO, N. Y. Genesee Building	DETROIT, MICHIGAN 2011 Book Building	NEW YORK, N. Y. Woolworth Building	READING, PENNA. Luria Building

ST. LOUIS, MISSOURI
2110 Railway Exchange Bldg.

SAN FRANCISCO, CALIFORNIA
Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	July 18, 1950	July 11, 1950	June 20, 1950	July 19, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plate	3.50	3.50	3.50	3.40
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.35	6.35	6.35	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: (dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	July 18, 1950	July 11, 1950	June 20, 1950	July 19, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$50.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	46.47
No. 2, Birmingham	42.38	42.38	42.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	49.74
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)	July 18, 1950	July 11, 1950	June 20, 1950	July 19, 1949
Heavy melt'g steel, P'gh.	$41.75	$41.75	$44.75	$20.75
Heavy melt'g steel, Phila.	32.50	32.50	33.75	17.50
Heavy melt'g steel, Ch'go	37.25	37.00	38.50	19.75
No. 1 hy. com. sh't, Det.	36.00	36.00	39.50	12.75
Low phos. Young'n	42.75	42.75	45.25	21.25
No. 1 cast, Pittsburgh	43.75	43.75	43.75	27.00
No. 1 cast, Philadelphia	38.50	38.50	39.50	27.50
No. 1 cast, Chicago	45.50	45.50	46.50	31.00
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.25
Foundry coke, prompt	16.25	16.25	16.25	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	22.50	22.50	22.50	17.625
Copper, Lake, Conn.	22.625	22.625	22.625	17.75
Tin, Straits, New York	92.50†	84.75*	78.00	$1.03
Zinc, East St. Louis	15.00	15.00	15.00	9.50
Lead, St. Louis	11.80	10.80	11.80	13.825
Aluminum, virgin	17.50	17.50	17.50	17.00
Nickel, electrolytic	51.22	51.22	51.22	42.93
Magnesium, ingot	21.50	21.50	21.50	20.50
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
July 18, 1950	3.837¢ per lb.	$46.38 per gross ton	$37.17 per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	37.08 per gross ton
One month ago	3.837¢ per lb.	46.38 per gross ton	39.00 per gross ton
One year ago	3.705¢ per lb.	45.91 per gross ton	19.33 per gross ton

	Finished Steel Base Price High		Finished Steel Base Price Low		Pig Iron High		Pig Iron Low		Scrap Steel High		Scrap Steel Low	
1950	3.837¢	Jan. 3	3.837¢	Jan. 3	$46.38	Feb. 7	$45.88	Jan. 3	$40.92	June 6	$26.25	Jan. 3
1949	3.837¢	Dec. 27	3.3705¢	May 3	46.87	Jan. 18	45.88	Sept. 6	43.00	Jan. 4	19.33	June 28
1948	3.721¢	July 27	3.193¢	Jan. 1	46.91	Oct. 12	39.58	Jan. 6	43.16	July 27	39.75	Mar. 9
1947	3.193¢	July 29	2.848¢	Jan. 1	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.848¢	Dec. 31	2.464¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.396¢		2.396¢		$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.396¢		2.396¢		23.61		23.61		$19.17		$19.17	
1942	2.396¢		2.396¢		23.61		23.61		19.17		19.17	
1941	2.396¢		2.396¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$19.17	Apr. 10
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.26689¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	32.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1935	2.07542¢	Oct. 1	2.06492¢	Jan. 8	18.84	Nov. 5	17.83	May 14	13.42	Dec. 10	10.33	Apr. 29
1932	1.89196¢	July 5	1.83910¢	Mar. 1	14.81	Jan. 5	13.56	Dec. 6	8.50	Jan. 12	6.43	July 5
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipment. Index recapitulated in Aug. 23, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00[1]													$50.00[31]
Alloy, net ton	$51.00[1,17]													$51.00[31]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00[1]	$53.00[1]	$53.00[1]				$57.00[13]		$53.00[3]	$58.00[26]	$53.00[3]			
Carbon forging billets, net ton	$63.00[1]	$63.00[1,4]	$63.00[1,8]	$63.00[4]			$63.00[25]		$63.00[3,4]	$65.00[26]	$63.00[3]			$66.00[31]
Alloy, net ton	$66.00[1,17]	$66.00[1,4]	$66.00[1]		$66.00[4,42]		$66.00[13]	$66.00[8]	$66.00[3,4]	$68.00[26]	$66.00[3]			$66.00[31]
PIPE SKELP	3.15[1]						3.15[1,4]							
WIRE RODS	3.85[3,18]	3.85[2,4,33]	3.85[6]	3.85[2]			3.85[6]				3.85[3]	3.95[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35[1,5,9,15]	3.35[23]	3.35[1,6,8]	3.35[4,8]			3.35[1,4,6] 3.50[13]		3.35[3]	3.45[26]		3.35[3]		3.55[12] 4.15[47]
Cold-rolled	4.10[1,5,7,9,15] 5.10[62]		4.10[1,6,8]	4.10[4,15]		4.10[7]	4.10[4,6]		4.10[3]			4.10[3]	4.30[22]	4.30[12]
Galvanized (10 gage)	4.40[1,9,15]		4.40[1,8]		4.40[4]		4.65[64] 4.75[44]					4.40[3]		
Enameling (12 gage)	4.40[1]		4.40[1,8]	4.40[4]		4.40[7]	4.40[6] 4.90[76]						4.60[22]	4.70[12]
Long ternes (10 gage)	4.80[9,15]		4.80[1]			4.80[7]	4.80[64]							
Hi Str. low alloy, h.r.	5.05[1,5,9]	5.05[1]	5.05[1,6,8]	5.05[4,8]			5.05[1,4,6,13]		5.05[3]	5.05[26]		5.05[3]		5.25[12]
Hi str. low alloy, c.r.	6.20[1,5,9]		6.20[1,6,8]	6.20[4,5]			6.20[4,6,13]		6.20[3]			6.20[3]		6.40[12]
Hi str. low alloy, galv.	6.75[1]											6.75[3]		
STRIP Hot-Rolled	3.25[5,7,9,28] 3.50[41]	3.25[3,66]	3.25[1,6,8]	3.25[5]			3.25[1,4,6] 3.50[13]		3.25[3]	3.35[26]		3.25[3]		3.45[12] 4.05[47]
Cold-rolled	4.15[5,7,9] 4.50[68]	4.30[3,66]	4.30[9]	4.15[2,5]		4.15[7]	4.15[4,6,48,49] 4.50[13,48]		4.15[3]			4.15[3]		4.35[12] 4.75[66] 4.95[47]
Hi str. low alloy, h.r.	4.95[9]		4.95[1,6,8]	4.95[5]			4.95[1,4,6,13]		4.95[3]	4.95[26]		4.95[3]		5.15[12]
Hi Str. low alloy, c.r.	6.20[9]			6.20[2,5]			6.20[4,6,13]		6.40[3]			6.40[3]		6.40[12]
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50[1,5,9,15]		$7.50[1,6,8]				$7.50[4]					$7.60[3]	$7.70[22]	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30[1,5,15]		5.30[1,8]				5.30[4]					5.40[3]	5.50[22]	
BARS Carbon steel	3.45[1,5,9]	3.45[1,4,28]	3.45[1,6,8]	3.45[4]	3.45[4]		3.45[1,4,6]		3.45[3,4]		3.45[3]			3.65[12]
Reinforcing‡	3.45[1,5]	3.45[4]	3.45[1,6,8]	3.45[4]			3.45[1,4,6]		3.45[3,4]		3.45[3]	3.45[3]		
Cold-finished	4.10[5] 4.15[3,4,17,53,69,71]	4.15[2,23,69,70]	4.15[4,73,74]	4.15[2,61]	4.15[4,32,62]		4.15[6,40,57]		4.15[70]					4.35[12] 4.30[64]
Alloy, hot-rolled	3.95[1,17]	3.95[1,4,28]	3.95[1,6,8]		3.95[4]		3.95[1,6,25]	3.95[3]	3.95[3,4]		3.95[3]			4.25[12]
Alloy, cold-drawn	4.90[2,17,53,69,71]	4.90[2,23,69,70]	4.90[4,73,74]	4.90[2,61]	4.90[4,43,62]		4.90[6,25,57]	4.90[3]	4.90[3,70]					5.05[64]
Hi str. low alloy, h.r.	5.20[1,5]		5.20[1,6,8]	5.20[4]			5.20[1,6]	5.20[3]	5.20[3]		5.20[3]			5.40[12]
PLATE Carbon steel	3.50[1,5]	3.50[1]	3.50[1,6,8]	3.50[4]			3.50[1,13]		3.50[3]	3.60[26]	3.50[3]	3.50[3]		3.75[12]
Floor Plates	4.55[1]	4.55	4.95[3]	4.55[5]						4.55[26]				
Alloy	4.40[1]	4.40[1]	4.40[1]				4.40[13]			4.40[26]	4.40	4.40[3]		
Hi Str. low alloy	5.35[1,5]	5.35[1]	5.35[1,8]	5.35[4,8]			5.35[6]			5.35[26]	5.35[3]	5.35[3]		5.60[12]
SHAPES, Structural	3.40[1,5,9]	3.40[1,28]	3.40[1,6,8]					3.45[3]	3.45[3]		3.45[3]			
Hi Str. low alloy	5.15[1,5]	5.15[1]	5.15[1,6,8]				5.15[6]	5.20[3]	5.20[3]		5.20[3]			
MANUFACTURERS' WIRE Bright	4.50[2,5,18]	4.50[2,4,12,33,34]		4.50[2,77]			4.50[6]	Kokomo=4.60[20]			4.50[3]	4.60[3]	Duluth=4.50[3] Pueblo=4.75[14]	
PILING, Steel Sheet	4.20[1,9]	4.20[1]							4.20[3]					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging, net ton
	$69.00[83]				Alloy, net ton
		$53.00[11]	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00[83]	$63.00[11]	F=$82.00[19]	Geneva=$63.00[16]	Carbon forging billets, net ton
	$74.00[83]		F=$85.00[19]		Alloy net ton
					PIPE SKELP
	4.25[83]	3.85[11]	SF=4.50[24] LA=4.85[24,62]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35[4,11]	SF, LA=4.05[24] F=4.25[19]	Ashland=3.35[7] Niles=3.50[84]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10[11]	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40[4,11]	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05[11]	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85[83]	3.65[83]	3.25[11]	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.75[19] LA=5.85[27]	New Haven=4.65[4], 5.00[69] Trenton=5.00[65]	Cold-rolled
		4.95[11]	F=6.64[19]		Hi Str. low alloy, h. r.
			F=8.95[19]		Hi Str. low alloy, c. r.
		7.60[11]	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05[83]	3.85[83]	3.45[4,11]	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	BARS Carbon steel
4.05[83]	3.85[83]	3.45[4,11]	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55[83]	4.35[83]		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark[69], Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20[11]	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90[83]	3.50[4,11]	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[20] Coatesville=3.60[21] Harrisburg=3.85[35]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35[11]	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00[83]	3.80[83]	3.40[11]	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.45[56] Geneva=3.40[16]	SHAPES, Structural
		5.15[11]	F=4.00[19] S=4.05[62]	Fontana=5.75[10] Geneva=5.15[16]	Hi Str. low alloy
5.10[83]	4.90[83]	4.50[4,11]	SF, LA=5.45[24,62]	Portsmouth=4.50[20] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes deduct $1.15 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 John A. Roebling's Sons Co., Trenton, N. J.

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	13.75	14.50	16.00	15.50	23.75	19.25	21.00	12.25	14.25	12.50
Slabs, billets, rerolling	18.00	19.25	21.25	20.25	31.25	25.50	27.75	16.00	19.50	16.25
Forg. discs, die blocks, rings	32.00	32.00	34.50	33.50	50.50	38.00	42.50	26.00	26.50	25.50
Billets, forging	25.75	25.75	27.75	27.00	40.50	30.50	34.25	21.00	21.50	21.50
Bars, wire, structurals	30.00	30.00	32.50	31.50	47.50	35.50	40.00	24.50	25.00	25.00
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	39.00	39.00	41.00	41.00	54.50	47.00	51.50	34.50	35.00	37.00
Strip, hot-rolled	25.50	27.00	31.25	29.00	47.25	35.75	40.00	22.50	29.25	23.00
Strip, cold-rolled	32.00	34.50	38.00	36.50	56.50	46.00	50.00	28.50	35.00	29.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38,39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 15; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*; add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

	Base Column To dealers, f.o.b. mill	*Pittsburg, Calif.*
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	*Pittsburg, Calif.*
Merch. wire annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa., (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence Posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated**	8.85
Track bolts, heat treated, to railroads**	9.10

** Minnequa, deduct 25¢. † Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, 3; Minnequa, 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, 6; Youngstown, 4.

Track bolts: Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Indiana Harbor, Ind., 79; Johnstown, Pa., 3.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	*Black*	*Galv*
⅛-in.	40½ to 38½	21 to 19
¼-in.	43½ to 41½	25 to 23
1-in.	46 to 44	28 to 26
1¼-in.	46½ to 44½	28½ to 26½
1½-in.	47 to 45	29 to 27
2-in.	47½ to 45½	29½ to 27½
2½ to 3-in.	48 to 46	30 to 28
Steel, lapweld		
2-in.	38	19½
2½ to 3-in.	42	23½
3½ to 6-in.	43 to 40	24½ to 21½
Steel, seamless		
2-in.	36	17½
2½ to 3-in.	39	20½
3½ to 6-in.	41	22½
Wrought iron, buttweld		
⅛-in.	+26½	+56
¼-in.	+16½	+45
1 & 1¼-in.	+10½	+36
1½-in.	+ 4½	+32½
2-in.	+ 4	+32
Wrought iron, lapweld		
2-in.	+13½	+40
2½ to 3½-in.	+11	+35½
4-in.	+ 6	+29½
4½ to 8-in.	+ 8	+31
9 to 12-in.	+18	+40½

Extra Strong, Plain Ends

Steel, buttweld		
⅛-in.	39½ to 37½	21½ to 19½
¼-in.	43½ to 41½	25½ to 23½
1-in.	45½ to 43½	28½ to 26½
1¼-in.	46 to 44	29 to 27
1½-in.	46½ to 44½	29½ to 27½
2-in.	47 to 45	30 to 29
2½ to 3-in.	47½ to 45½	30½ to 28½
Steel, lapweld		
2-in.	37	19½
2½ to 3-in.	42	24½
3½ to 6-in.	44½ to 41½	27 to 24
Steel, seamless		
2-in.	35	17½
2½ to 3-in.	38	21½
3½ to 6-in.	42½	25
Wrought iron, buttweld		
⅛-in.	+22	+50
¼-in.	+15½	+43
1 to 2 in.	+ 5½	+32
Wrought iron, lapweld		
2-in.	+10½	+36½
2½ to 4-in.	+ 1	+25
4½ to 6-in.	+ 5	+29½
7 & 8-in.	list	+24½
9 to 12-in.	+11½	+32½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld lapweld steel pipe, jobbers are granted a discount of 5 pct.
* Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in In.	gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb. (Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (18 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore	5.15	6.39[1]	6.85[2] 6.65	5.50–5.55[11]	....	5.40–6.04[11]	5.69	5.59	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.15[10]	5.95	6.15[7]	5.10	....	5.40	5.25	5.10	6.68	....	....	....	....
Boston	5.75	6.55[20]	6.94[9] 7.14	5.70	6.90–6.95	6.08	5.75	5.80	6.19–6.69	9.70–9.97	8.50–10.00	11.15	11.45
Buffalo	5.15	5.95	6.94	5.41	7.27	5.65	5.35	5.15	5.75	9.60	9.90	11.05	11.35
Chicago	5.15	6.20	6.85	5.10	6.80	5.40	5.25	5.10	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.42–5.97	5.99–6.24	6.39	5.35	....	5.79	5.64	5.35–5.54	5.96–6.25	9.60–9.81	9.90–10.11	11.05–11.26	11.35–11.56
Cleveland	5.15	5.95	7.00–7.10	5.24	6.35	5.52	5.37	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.06–6.33	7.09	5.49	6.43–6.80	5.59–5.79	5.64–5.68	5.39	5.91	9.56	9.86	11.01	11.31
Houston	6.00	....	....	6.10	....	6.00	5.95	6.10	7.60	10.25–10.45	10.50–10.60	11.50	11.95–12.10
Indianapolis	....	....	....	....	7.38	....	....	....	6.15	....	....	....	....
Kansas City	5.75	6.55	7.45	5.70	6.95	6.00	5.85	5.70	6.35	9.85	10.15	11.30	11.60
Los Angeles	5.90	7.45	7.80[2]	5.95	8.35[16]	6.00	5.90	5.90	7.55	10.75	10.75	12.45	12.75
Memphis	5.93	6.68	....	5.98	6.80–6.81	6.08	5.93	5.68	6.51	....	....	....	....
Milwaukee	5.29	6.09	6.94–6.99	5.24	6.32	5.54	5.39	5.24	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.75	....	5.55[1]	6.80	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55	6.85[1] 6.89[1]	7.20[2]	5.84	6.90[1] 6.76	5.90	5.65	5.75	6.80 6.44	9.60	9.90	11.05	11.35
Norfolk	6.10[13]	7.00	....	6.30[13]	....	6.15[13]	6.20[13]	6.15[13]	7.20[13]	....	....	....	....
Philadelphia*	5.30	6.35	6.80	5.65	6.29	5.65	5.45	5.65	6.21	9.35	9.65	10.80	11.10
Pittsburgh	5.15	6.45 5.95	6.85[2] 6.60	5.20	5.95–6.00	5.35	5.25	5.10	5.75	9.25	9.55	10.70	11.00
Portland	6.60–7.10[1]	8.40[2]	....	6.85[9]	....	6.40[9]	6.50	6.45–6.45[9]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	....	7.45	8.75	6.10[3]	5.90	7.35[3]	8.75	....	....	....	....
San Francisco*	6.20	7.60[2]	7.65[3]	6.15	7.85[16]	6.10	6.00	6.00	7.55	10.75	10.75	12.45	12.75
Seattle	6.60[4]	8.15[2]	8.40[2]	6.65[4]	....	6.35[4]	6.20[4]	6.35[4]	8.50[14]	....	11.60[18]	....	13.60[18]
St. Louis	5.48	6.28	7.10	5.43	6.68–7.54	5.73	5.58	5.43	6.09	9.58	9.88	11.03	11.33
St. Paul*	5.71	6.51	7.41	5.66	6.16–6.82	5.96	5.81	5.66	6.31	9.81	10.11	11.26	11.56

BASE QUANTITIES: (*Standard unless otherwise keyed on prices.*)
Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....	Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Birmingham	41.88	42.38	.....	.....	.....	Boston	Steelton	6.90	.....	.....	.....	.....	60.90
Buffalo	46.00	46.50	47.00	.....	.....	Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Chicago	46.00	46.50	46.50	47.00	.....	Cincinnati	Birmingham	6.79	48.58	49.08	.....	.....	.....
Cleveland	46.00	46.50	46.50	47.00	51.00	Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Duluth	46.00	46.50	46.50	47.00	.....	Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Erie	46.00	46.50	46.50	47.00	.....	Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Everett	....	50.50	51.00	.....	.....	Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Granite City	47.90	48.40	48.90	.....	.....	Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Ironton, Utah	46.00	46.50	.....	.....	.....	Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Pittsburgh	46.00	46.50	46.50	47.00	.....	Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
Geneva, Utah	46.00	46.50	.....	.....	.....	San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....	Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Steelton	48.00	48.50	49.00	49.50	54.00	St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Struthers, Ohio	46.00	.....	.....	.....	.....	Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....								
Toledo	46.00	46.50	46.50	47.00	.....								
Troy, N. Y.	48.00	48.50	49.00	.....	54.00								
Youngstown	46.00	46.50	46.50	47.00	.....								

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$37.00; f.o.b. Buffalo, $38.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Besemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. & shorter	26	37
All diam, longer than 6 in.	22	34
Lag, all diam, longer than 6 in.	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagons or Square)

½ in. and smaller	25	37
9/16 to ⅝ in.	23	35
¾ to 1½ in. inclusive	23	35
1⅝ in. and larger	16	29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	$7.25

Small Rivets

(7/16 in. and smaller)
Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	43

Cap and Set Screws

(In bulk)

	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	23
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.50¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	17.00¢
8 to 16	48, 60, 72	17.00¢
7	48, 60	18.64¢
6	48, 60	19.65¢
4, 5	40	20.48¢
3	40	21.53¢
2½	24, 30	22.05¢
2	24, 30	24.15¢
CARBON		
40	100, 110	7.65¢
35	65, 110	7.65¢
30	65, 84, 110	7.65¢
24	72 to 104	7.65¢
20	84, 90	7.65¢
17	60, 72	7.65¢
14	60, 72	8.16¢
10, 12	60	8.42¢
8	60	8.67¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)..	*26.50	
Washgtn, Pa. (39)....	*26.50	
Claymont, Del. (29)...	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55).	*26.50	*24.00
Nickel-carbon		
10 pct, Coatsville (21)..	31.00	
Inconel-carbon		
10 pct, Coatesville (21)..	39.00	
Monel-carbon		
10 pct, Coatsville (21)..	32.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7).....		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	21.00
St. Louis, del'd	22.18
Birmingham, del'd	20.20

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$37.00
60% or less	34.00

Prices Continued on Page 152

REFRACTORIES

(F.o.b. works)

Fire Clay Brick	*Carloads, Per* 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$86.00
No. 1 Ohio	80.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	80.00
No. 2 Ohio	72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	14.00

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$86.00
Childs, Pa.	90.00
Hays, Pa.	91.00
Chicago District	95.00
Western Utah and Calif.	101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago	106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	15.00
Silica cement, net ton, bulk, Hays, Pa.	17.00
Silica cement, net ton, bulk, Ensley, Ala.	16.00
Silica cement, net ton, bulk, Chicago District	16.00
Silica cement, net ton, bulk, Utah and Calif.	22.50

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester	$69.00

Magnesite Brick	
Standard, Baltimore	$91.00
Chemically bonded, Baltimore	80.00

Grain Magnesite	*St. ¾-in. grains*
Domestic, f.o.b. Baltimore, in bulk fines removed	$56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk	33.00
in sacks	38.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $13.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	36.0¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	70.0¢ to $1.35
Aluminum	29.00¢
Brass, 10 ton lots	27.75¢ to 31.25¢
Copper, electrolytic	9.25¢ plus metal value
Copper, reduced	9.75¢ plus metal value
Cadmium, 100-199 lb	$2.95
Chromium, electrolytic, 99% min., and quantity	$3.50
Lead	6.5¢ plus metal value
Manganese	$2.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	75.5¢
Nickel, annealed	81.5¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	$2.90
Zinc, 10 ton lots	20.50¢ to 23.35¢

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago	$91.80 to $95.30
6 to 24-in., del'd N. Y.	91.00 to 92.00
6 to 24-in., Birmingham	78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	$108.50 to $113.00

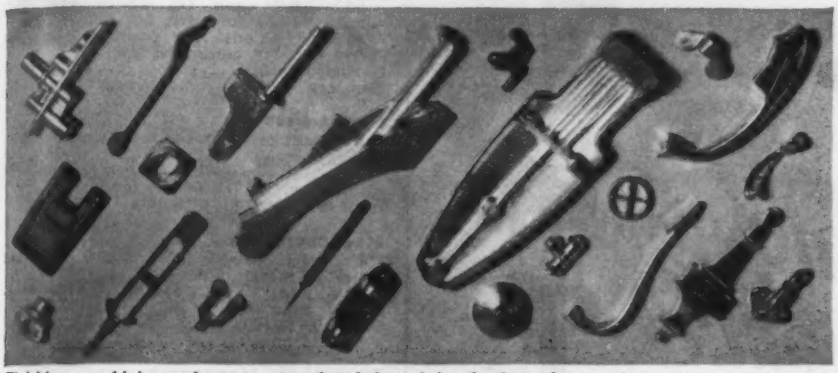
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

Prices Continued on Page 154

COPPER ALLOY BULLETIN

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by BRIDGEPORT BRASS COMPANY "Bridgeport" Headquarters for BRASS, BRONZE and COPPER



Finishing, machining and scrap costs reduced through hot forgings of copper-base alloys on wide range of parts—Courtesy Brass Forgings Company, Ferndale, Mich.

Hot Forgings Reduce Machining, Finishing Costs of Brass Parts

Cost and quality-conscious manufacturers are turning more than ever to hot forging of copper-base alloys as a means of eliminating machining of intricate shapes and materially reducing expensive polishing and buffing procedures.

Not only is the forged surface smoother than that of a sand casting, but the part is free from porosity and has greater strength, toughness and resistance to wear and fatigue. Rejections through porous or faulty castings are also eliminated by forgings.

The closer tolerances which can be held in forging may in many instances eliminate machining of clearances and non-precision dimensions.

Wide Range of Products

The illustrated hot forgings, produced by Brass Forgings Co., Ferndale, Mich., show a wide range of applications—refrigeration and builders' hardware; automotive, welding, and blow torch equipment; surgical instruments; SAE fittings; navigational instruments, machine gun parts, and wing nuts.

In the majority of these parts, corrosion from the atmosphere, moisture and other media must be withstood, and moderate strength is desired. For these reasons, as well as for color in decorative items, brass has been selected.

The standard forging alloy, which answers normal demands in corrosion resistance, wear, toughness and strength, as well as excellent forging characteristics, contains approximately 60% copper, 1.75% lead, 0.2% tin, and the remainder zinc. The lead content makes this alloy exceptionally good for machining. It has a tensile strength of 60,000 psi in the forged condition and a Rockwell hardness of B52.

Duronze III For Strength

In cases where greater strength, wear resistance and hardness are essential, silicon aluminum bronze, (Duronze III), 91% copper, 7% aluminum and 2% silicon, is suggested. This bronze has a tensile strength of 85,000 psi, a Rockwell hardness of B85 and a yield strength of 45,000 psi as compared to brass and silicon bronze forgings averaging about 25,000 psi.

Silicon aluminum bronze is about 10% lighter than silicon bronze and forges at a temperature between 700 and 800 degrees centigrade. Despite its high strength and hardness it is very plastic at forging temperatures. It also has a very high resistance to corrosion in comparison to the normal forging alloys.

Other Forging Alloys

Silicon bronze with 97% copper and 3% silicon is stronger and tougher than copper. It resists weathering and is used for outdoor and electrical hardware, large bolts, screw products, marine hardware and sewage disposal equipment.

Naval brass is widely used for marine hardware for its resistance to corrosion from sea water. It contains about 60% copper, 0.75% tin and the remainder zinc. Due to the absence of lead, machinability is reduced. The machinability of this alloy can be increased through the addition of one or two per cent lead.

Manganese Bronze — Contains approximately 58.5% copper, 1% iron, 0.3% manganese and remainder zinc. Used for valve parts, and for parts where greater strength than brass is needed.

Muntz Metal—Forges readily, but is not free machining. Contains 60% copper and 40% zinc. Used for miscellaneous work such as large bolts and nuts. Does not resist corrosion as well as other alloys under certain conditions.

Bridgeport's Laboratory will supply further information on the characteristics of various forging alloys and help engineers select the correct alloy for specific uses. Call our nearest district office or write Bridgeport.

Bulletin Reprints Available

Reprints of the Copper Alloy Bulletin are available to those of you who want to build up a reference set. Also available is a limited number of back issues for those who do not have a complete set.

Make sure you receive the Bulletin by mail. *Write:* Editor of Copper Alloy Bulletin, Bridgeport Brass Company, Bridgeport 2, Conn.

FERROALLOYS *Continued*

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn. 18.15¢

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Prices Continued on Page 156

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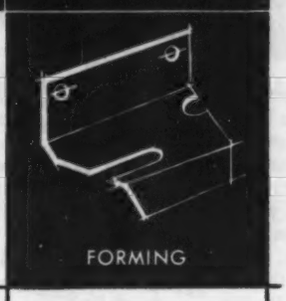

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Blanking, Forming, Punching, Drawing, Embossing, Stamping, Shearing

SUB-ASSEMBLY, FABRICATION
Stampings Assembly, Welding—Arc, Gas, Seam and Spot, Etc.

TOOL MAKING
Dies, Jigs, Fixtures

FINISHING
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Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si.			21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contrast price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C	$1.09
0.50% max. C	1.05
.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ⅛ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carload ..... 7.65¢
- Ton lots ..... 9.05¢

Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo ..... 96¢

Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.
- Ton lots $3.50
- Less ton lots 3.55

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $2.67

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.13

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.28

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.40
Less ton lots $1.45

Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $167.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $2.25

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
- Openhearth $2.90
- Crucible 3.00
- High speed steel (Primos) 3.10

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. ..... 95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa. ..... 94¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk, lump ..... 11.00¢
- Ton lots, bulk, lump ..... 11.50¢
- Less ton lots, lump ..... 12.25¢

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.20

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- Carload, bulk ..... 6.60¢

Boron Agents

Contract prices per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B $4.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound ..... 45¢
- Less ton lots, per pound ..... 50¢

Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
- Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb, up
- 10 to 14% B ..... .75
- 14 to 19% B 1.20
- 19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... 93¢
- No. 6 ..... 63¢
- No. 79 ..... 45¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.
- Ton lots $1.46
- Less ton lots 1.57

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
- Less ton lots $1.80

Silcaz, contract basis, delivered.
- Ton lots ..... 45.00¢

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THE CLEARING HOUSE

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Bullish Effect — Pittsburgh used machinery dealers feel that the present strong demand for new machinery may have a bullish effect on the used equipment field. This is based on the theory that new machinery manufacturers, falling behind in the delivery of some items, may lose part of their demand to dealers who can ship machines immediately.

Fewer Rebuilders—The number of used machinery firms engaged in rebuilding machines for sale to Detroit firms has been steadily declining since the postwar era. Many firms prefer to rebuild machines to their own specifications rather than buy one that has been rebuilt by a dealer.

Inventory Problem—Dealers in the Philadelphia area find that their biggest problem is the replacement of inventories. Users don't want to sell their used or obsolescent machinery. Under the present policy of management, users are not certain of being able to replace the equipment they sell.

There may be no need for such equipment at the moment, or even in the foreseeable future. In spite of this, plant managers hesitate to dispose of their equipment because of the high cost of replacement with new or late type used equipment.

NISA Award Contest—E. W. Easter of Industrial Engineering Equipment Co., Davenport, Iowa, and Robert Donelson of W. C. Krauth Electric Co., Louisville, Ky., were tied for first place in the recent award contest sponsored by the National Industrial Service Assn. Prizes of $75 were awarded to each at the Boston convention. Both men submitted designs for portable soldering pots for soldering coil connections of large machines.

The contest was designed to unearth good ideas, methods or gadgets that would benefit firms in the motor service industry. All entries sent in became association property and will be used by member firms for their benefit. Entries were submitted by photographs, sketches, written descriptions and working models. As soon as final drawings are made from these entries, NISA will mail them to the membership.

Other Awards—Arthur Wagner of Arthur Wagner Co., Chicago, won the second place award of $50 for his design of an adjustable stator winding former. Robert Giles of Giles Armature & Electric Works, Marion, Ohio, won the third place award of $25 for a simple test method for locating "opens" in a squirrel cage winding, using iron filings and a growler.

Honorable Mentions—in addition, honorable mention awards of $5 were made to the following: Angelo Rizzo of Dynamo & Motor Exchange, Buffalo, for a device designed to wipe excess varnish from taped coils after dipping: J. L. Roper III of C & H Electric Co., Miami, Fla., for an adapter to extend an Ideal Midget coil winder head for use in making occasional larger coils; W. B. Kelly of Tennessee Electric Motor Service, Nashville, Tenn., for gage blocks to set calipers when boring vertical commutators; and H. T. Peterson of Electrical Engineering & Equipment Co., Des Moines, Iowa, for a device enabling a single man to handle heavy wire reels.

Detroit MDNA — At its May meeting prior to recess for the summer months, the Detroit MDNA elected the following officers for the coming year: John D. Howarth of International Machinery Co., chairman; Hubert Marks of J. Lee Hackett Co., secretary; and William L. Howarth of National Machinery Co., treasurer.